

# 2011 Pelagic Plan Team Report for Guam

## Introduction and Summary

Pelagic fishing vessels based on Guam are classified into two general groups: distant-water purse seiners and longliners that fish outside Guam's economic exclusive zone (EEZ) and transship through the island, and small, primarily recreational, trolling boats that are either towed to boat launch sites or berthed in marinas and fish only within local waters, either within Guam's EEZ or on some occasions in the adjacent EEZ of the Northern Mariana Islands. This annual report covers primarily the local, Guam-based, small-boat pelagic fishery.

The estimated annual pelagic landings have varied widely, ranging between 322,000 and 937,000 pounds in the 30-year time series. The average total catch has shown a slowly increasing trend over the time period. The 2011 total pelagic landings were approximately 588,415 pounds, a decrease of 19% compared with 2010. Landings consisted primarily of five major species: mahimahi (*Coryphaena hippurus*), wahoo (*Acanthocybium solandri*), bonita or skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), and Pacific blue marlin (*Makaira mazara*). Other minor species caught include rainbow runner (*Elagatis bipinnulatus*), kawakawa (*Euthynnus affinis*), dogtooth tuna (*Gymnosarda unicolor*), double-lined mackerel (*Grammatorcynus bilineatus*), and oilfish (*Ruvettus pretiosus*). Sailfish and sharks were also caught during 2011. However, these species were not encountered during offshore creel surveys and was not available for expansion for this year's report. While sailfish is kept, sharks are often discarded as bycatch. In addition to the above pelagic species, approximately half a dozen other species were landed incidentally this year.

The number of boats involved in Guam's pelagic or open ocean fishery gradually increased from 193 in 1983 to 469 in 1998. This number decreased until 2001, but has generally been increasing since that year. There were 454 boats involved in Guam's pelagic fishery in 2011, an increase of 5% from 2010. A majority of the fishing boats are less than 10 meters (33 feet) in length and are usually owner-operated by fishermen who earn a living outside of fishing. Most fishermen sell a portion of their catch at one time or another and it is difficult to make a distinction between recreational, subsistence, and commercial fishers. A small, but significant, segment of the pelagic group is made up of marina-berthed charter boats that are operated primarily by full-time captains and crews. Data and graphs for non-charters, charters, and bycatch are represented in this report.

There are general wide year-to-year fluctuations in the estimated landings of the five major pelagic species. Catch amounts for the five common species showed mixed changes from 2010 levels. 2011 mahimahi catch decreased more than 67% from 2010, wahoo catch totals decreased 16.2% from 2010, bonita increased by 3% from 2010, Pacific blue marlin catch decreased 41% from 2010, and yellowfin tuna increased 234% from 2010.

Aggregate landings of all pelagics, tuna, and non-tuna Pelagic Management Unit Species (PMUS) decreased in 2011 from 2010 levels. Landings of all pelagics decreased 19%, with tuna PMUS increasing 18% and non-tuna PMUS decreasing more than 58%. The number of trolling boats increased by 5%, the number of trolling trips decreased by 23.8% and hours spent trolling decreased by 16%. Weather on Guam was poor for much of 2010, with many days of wind and

rain. There was a higher than average number of small craft advisory days in 2010, which would limit the number of trips taken as well. Trolling catch rates (pounds per hour fished) showed a slight decrease compared with 2009. Total CPUE was down 1.5%, with yellow fin tuna showing the greatest increase. Bonita CPUE also increased, while marlin, and mahi mahi showed decreases. Wahoo CPUE was virtually unchanged from 2009.

Commercial landing data for 2011 shows a decrease from 2010 levels. Commercial landings and revenues decreased in 2011, with total adjusted revenues decreasing 37%. The adjusted average price for all pelagics decreased 4.7%, with tuna PMUS prices decreasing 2%, and non-tuna PMUS decreasing 5%. Adjusted revenue per trolling trip decreased 7.1% for all pelagics, increased 98.2% for tuna PMUS, and decreased 23.3% for non-tuna PMUS. Commercial landings have shown a decreasing trend over the past ten years. While the adjusted average price of pelagic species decreased last year, the number of boats in the fishery increased. A majority of troll fishermen do not rely on the catch or selling of fish as their primary source of income. Previously, Guam law required the government of Guam to provide locally caught fish to food services in government agencies, such as Department of Education and Department of Corrections. In 2002, the government of Guam began implementing cost-saving measures, including privatization of food services. The requirement that locally fish be used for food services, while still a part of private contracts, is not being enforced. This has allowed private contractors to import cheaper foreign fish, and reduced the sales of vendors selling locally caught fish. This represented a substantial portion of sales of locally caught pelagic fish. The decrease in commercial sales seen following 2002 may be, in part, due to this change.

In October, 2005, one 35 foot boat began short lining for sharks at the southern banks, with the expectation to sell shark meat to Mexico. After this venture failed, the vessel tried vertical long lining, short lining, and deep bottom fishing, all without commercial success. The fisherman has since switched his operation to shallow bottom fishing at offshore banks.

In early 2010, the U.S. military began exercises in an area south and southeast of Guam designated W-517. W-517 is a special use airspace (SUA) (approximately 14,000 nm<sup>2</sup>) that overlays deep open ocean approximately 50 miles south-southwest of Guam. Exercises in W-517 generally involve live fire and/or pyrotechnics. When W-517 is in use, a notice to mariners (NTM) is issued, and vessels attempting to use the area are advised to be cautious of objects in the water and other small vessels. This discourages access to virtually all banks south of Guam, including Galvez, Santa Rosa, White Tuna, and other popular fishing areas. From 1982-2009, DAWR surveys recorded more than 2020 trolling and bottom fishing trips to these southern banks, an average of more than 72 trips per year. During 2011, 59 NTM comprising a total of 101 days (27.6% of all days) were issued for area W-517. This makes access to these banks less attractive fishing areas for more than 1/4 of the year. Additionally, the military occasionally holds exercises that do not involve live fire, but still restrict access to the area. As no notice is given for these events, there is not a reliable way to track how frequently this occurs.

The shortage of staff biologists has been significant in the past several years. DAWR staff biologists continue to oversee several projects simultaneously, while providing on-going training to ensure the high quality of data being collected by all staff. All fisheries staff are trained to identify the most commonly caught fish to the species level. New staff are mentored by biologists and senior technicians in the field before conducting creel surveys on their own.

The makeshift ramp at Ylig Bay was eliminated in 2010. Widening of the main road on the south east coast of Guam will cause removal of the ramp. In December, 2006, a new launch ramp and facility was opened in Acfayan Bay, located in the village on Inarajan on the southeast coast of Guam. Monitoring of this ramp for pelagic fishing activity began at the start of 2007. In early 2007, this facility was damaged by heavy surf, and has yet to be repaired. Monitoring of this ramp is currently on hold until the ramp is repaired. The current financial situation in Gov Guam makes it unlikely this ramp will be repaired in the near future. With the loss of the Ylig ramp and the destruction of the ramp in Acfayan bay, there will be no boat launching facilities on the east side of Guam.

No FADs were deployed in 2011. Issues with procurement delayed awarding of a FAD deployment contract. DAWR has two more systems, and is awaiting the awarding of the deployment contract to deploy the remaining 2. This should bring the number of FADS on station to 9, of the fourteen considered to be a full complement.

For more information, the WESPAC website is [www.wpcouncil.org](http://www.wpcouncil.org).

## **Recommendations**

### **2010 Recommendations**

1. The PPT recommends that the Council discuss with the military methods of documenting and surveying fishing activity taking place on military bases. The military provides vessels for recreational use by military personnel, to include fishing. This fishery is currently not documented by DAWR. DAWR personnel have had difficulty with access to military bases to document this fishing activity, while other civilian contractors and personnel are able to enter and exit military property much more freely. Ease of access to military property and personnel by DAWR staff seems to vary from command to command. A written document defining fisheries survey protocols, necessity, and DAWR access would be beneficial addressing this gap in fisheries data.
2. The PPT recommends that the Council work with the military to coordinate with Guam natural resource agencies and local fishermen groups to allow better access to areas restricted due to increased military activity and exercises. This includes, but is not limited to, area W-517.
3. The PPT encourages DAWR and WPacFIN to conduct additional outreach with commercial vendors to increase participation in the commercial receipts program. A changing demographic of fishers, who are selling to novel vendors that are not being captured by the current commercial receipts program, is resulting in an underreporting of commercial sales on Guam. Similar problems are also being experienced in Saipan. Distrust of agencies and the use of commercial receipts data seems to be a common reason for not participating in the program.

## Tables

	Page
1. Guam 2011 creel survey-pelagic species composition	6
2. Guam 2011 annual commercial average price of pelagic species	7
3. Annual consumer price indexes and CPI adjustment factors	8
4. Trolling	
5. Offshore creel survey bycatch number summary - trolling	57

## Figures

	Page
1a Guam annual estimated total landings: All Pelagics, Tunas PMUS, and non-Tuna PMUS	9
1b Guam annual estimated total landings: All Pelagics, non-charter, charter	11
1c Guam annual estimated total landings: All Tunas, non-charter, and charter	13
1d Guam annual estimated total landings: Total Non-Tuna PMUS, Non-charter, and Charter	15
2a Guam annual estimated total landings: Total Mahimahi, Non-charter, and Charter	17
2b Guam annual estimated total landings: Total Wahoo, Non-charter, and Charter	19
3a Guam annual estimated total landings: Total Blue Marlin, Non-charter, and Charter	21
4a Guam annual estimated total landings: Total Skipjack Tuna, Non-charter, and Charter	23
4b Guam annual estimated total landings: Total Yellowfin Tuna, Non-charter, and Charter	25
5 Guam annual estimated commercial landings: All Pelagics, Tuna PMUS, and Non-Tuna PMUS	27
6 Guam estimated number of trolling boats	29
7a Guam annual estimated number of Total Troll trips, Non-Charter trips, and Charter trips	31
7b Guam annual estimated number of Total Troll hours, Non-Charter hours, and Charter hours	33
7c Guam annual estimated Average Trip Length (Hours/Trip): Average Hours/Trip, Non-Charter Hours/Trip, and Average Charter Hours/Trip	35
8 Guam annual estimated commercial inflated-adjusted total revenues	37
9 Guam annual price of All Pelagics, Tuna PMUS, Non-Tuna PMUS	39
10a Guam trolling catch rates: Overall Average CPH, Non-Charter, and Charter	41
10b Guam trolling catch rates: All Mahimahi, Non-Charter, and Charter	43
10c Guam trolling catch rates: All Wahoo, Non-charter, and Charter	45
11a Guam trolling catch rates: All Skipjack, Non-charter, and Charter	47
11b Guam trolling catch rates: All Yellowfin, Non-charter, and Charter	49
11c Guam trolling catch rates: All Blue Marlin, Non-Charter, and Charter	51

12	Guam inflation-adjusted revenues per trolling trip: All Pelagics, Tuna PMUS, Non-Tuna PMUS	53
13	Annual Guam Longline Landings	55

**Table 1. Guam 2011 Creel Survey - Pelagic Species Composition**

<b>Species</b>	<b>Total Landing (Lbs)</b>	<b>Non-Charter</b>	<b>Charter</b>
<b>Tuna PMUS</b>			
Skipjack Tuna	350193	340934	9259
Yellowfin Tuna	81814	80763	1051
Kawakawa	653	485	168
Albacore	0	0	0
Bigeye Tuna	0	0	0
Other Tuna PMUS	0	0	0
<b>Tuna PMUS Total</b>	<b>432660</b>	<b>422182</b>	<b>10478</b>
<b>Non-Tuna PMUS</b>			
Mahimahi	90888	81642	9246
Wahoo	37354	32809	4545
Blue Marlin	18895	17901	994
Black Marlin	0	0	0
Striped Marlin	0	0	0
Sailfish	1000	1000	0
Shortbill Spearfish	0	0	0
Swordfish	0	0	0
Oceanic Sharks	238	238	0
Pomfrets	0	0	0
Oilfish	0	0	0
Moonfish	0	0	0
Misc. Longline Fish	0	0	0
<b>Non-Tuna PMUS Total</b>	<b>148375</b>	<b>133590</b>	<b>14785</b>
<b>Non-PMUS Pelagics</b>			
Dogtooth Tuna	1840	1782	58
Rainbow Runner	3473	3446	27
Barracudas	2065	2029	36
Oceanic Sharks	0	0	0
Misc. Troll Fish	0	0	0
<b>Non-Specific Bottomfish Total</b>	<b>148375</b>	<b>133590</b>	<b>14785</b>
<b>Total Pelagics</b>	<b>588413</b>	<b>563029</b>	<b>25384</b>

**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel survey data. This table includes several species of barracuda and the double-lined mackerel, species that may not be included in other tables in this report. Pelagic totals may slightly differ in those tables.

**Table 2. 2011 Annual Commercial Average Price of Pelagic Species**

<b>Species</b>	<b>Average Price (\$/Lb)</b>
<b>Tuna PMUS</b>	
Bonita/skipjack Tuna	1.93
Yellowfin Tuna	2.11
Tunas (misc)	1.50
<b>Tuna PMUS Average</b>	<b>1.84</b>
<b>Non-Tuna PMUS</b>	
Mahi / Dolphinfinh	2.18
Wahoo	2.20
Marlin	1.46
Sailfish	1.62
Spearfish	1.50
Swordfish	3.00
Monchong	2.48
<b>Non-Tuna PMUS Average</b>	<b>2.06</b>
<b>Non-PMUS Pelagics</b>	
Dogtooth Tuna	1.50
Rainbow Runner	1.97
Barracuda	1.97
<b>Non-Specific Bottomfish Average</b>	<b>1.81</b>
<b>Pelagics Average</b>	<b>1.95</b>

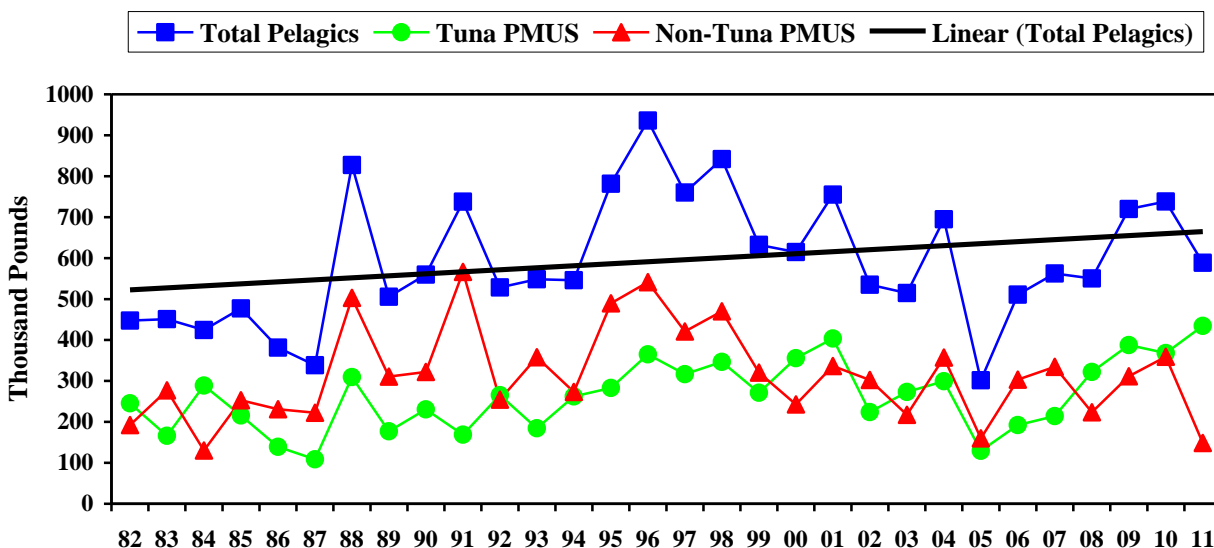
**Source:** The WPacFIN-sponsored commercial landings system.

**Table 3. Annual Consumer Price Indexes and CPI Adjustment Factor**

<b>Year</b>	<b>Consumer Price Index</b>	<b>CPI Adjust Factor</b>
1980	134.0	5.92
1981	161.4	4.92
1982	169.7	4.68
1983	175.6	4.52
1984	190.9	4.16
1985	198.3	4.00
1986	203.7	3.90
1987	212.7	3.73
1988	223.8	3.55
1989	248.2	3.20
1990	283.5	2.80
1991	312.5	2.54
1992	344.2	2.31
1993	372.9	2.13
1994	436.0	1.82
1995	459.2	1.73
1996	482.0	1.65
1997	491.3	1.62
1998	488.2	1.63
1999	497.2	1.60
2000	507.1	1.57
2001	500.0	1.59
2002	503.2	1.58
2003	517.0	1.54
2004	548.5	1.45
2005	590.5	1.34
2006	658.9	1.20
2007	703.5	1.13
2008	733.7	1.08
2009	749.2	1.06
2010	768.5	1.03
2011	793.5	1.00



**Figure 1a. Guam Annual Estimated Total Landings:  
All Pelagics, Tuna PMUS, and Non-Tuna PMUS**



**Interpretation:** The estimated total pelagic, tuna, and non-tuna PMUS have exhibited a cyclic trend, with a peak year followed by one or two down years. Total pelagic catch peaked in 1996, and had been decreasing until 2005. Since 2005, total has generally been increasing. Factors relating to this cycle may have to do with the biology of the fish or be weather related. There is also evidence from the fishermen and historic creel survey data that some pelagic fish species are not caught consistently year round around Guam.

Total pelagic and non-tuna PMUS decreased 19% and 58% respectively, compared with 2010, while tuna landings increased 18%. Non-tuna PMUS catch was well below the 30 year average, while the tuna PMUS catch was well above the 30 year average, and was the highest total on record. Total catch was slightly below the 30 year average. Generally, skipjack tuna are consistently caught year round, with the other major pelagic species being more seasonal. There is now a small fleet of vessels targeting skipjack tuna. These vessels fish almost every day, which is contributing to the high levels of tuna catch.

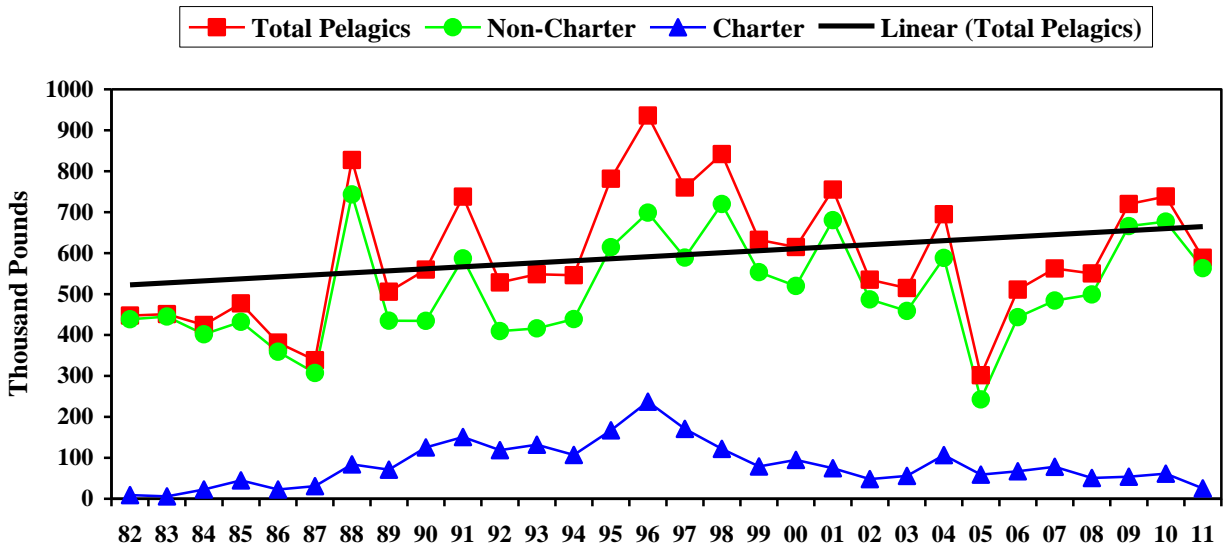
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel survey.

**Calculation:** A 365-day (366 days during leap years) quarterly expansion is run for each calendar year of survey data to produce catch and effort estimates for the pelagic fishery to avoid over-estimating seasonal pelagic species. Percent species composition is calculated by weight for the sampled catch for each method to produce catch estimates for each species for the expanded period. The annual catch for all pelagic species and the PMUS separately are summed across all methods to obtain the numbers plotted above.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 1a)**

<b>Year</b>	<b>All Pelagic</b>	<b>Tuna PMUS</b>	<b>Non-Tuna PMUS</b>
1982	447432	245400	192129
1983	450823	166105	277179
1984	424299	288634	130027
1985	477073	215686	252707
1986	381495	139099	230814
1987	338354	108729	222521
1988	827260	309571	502803
1989	505811	177158	310755
1990	559773	230559	321935
1991	737653	168669	566242
1992	528214	265333	254498
1993	548295	184394	357787
1994	545917	262181	273167
1995	781389	283055	489757
1996	935837	364929	541317
1997	759936	316552	420967
1998	841681	346634	469976
1999	632319	271359	320529
2000	614709	355581	242558
2001	754999	403691	336571
2002	534878	223805	302339
2003	514820	273029	217440
2004	694746	299495	357169
2005	301487	129489	159929
2006	510608	192365	303179
2007	562513	214014	334599
2008	550081	322053	223406
2009	719954	387643	311582
2010	738221	367960	359104
2011	588415	434501	148375
<b>Average</b>	<b>593633</b>	<b>264922</b>	<b>314379</b>
<b>Standard Deviation</b>	<b>153666</b>	<b>84465</b>	<b>111481</b>

Figure 1b. Guam Annual Estimated Total Landings:  
Total, Non-Charter, and Charter Pelagics



**Interpretation:** Non-charter trolling trips have always accounted for the bulk of the pelagic catch, although charter boats, which make up less than 5% of the troll fleet, account for a high proportion of trolling effort and catch. Prior to 1988, non-charter boats accounted for over 90% of the troll catch. In 1988, this percentage decreased due to an increase in charter boat activity catering specifically to Asian visitors. Beginning in 1996 however, a downturn in Japan's economy caused a significant decrease in charter trips and subsequent landings. No such trend is observed for non-charters. In 2011, total pelagic landings decreased 19%, non-charter landings decreased 16.8%, while charter landings decreased 58.6%. Non-charter boats landed 95.7% of all pelagics in 2011.

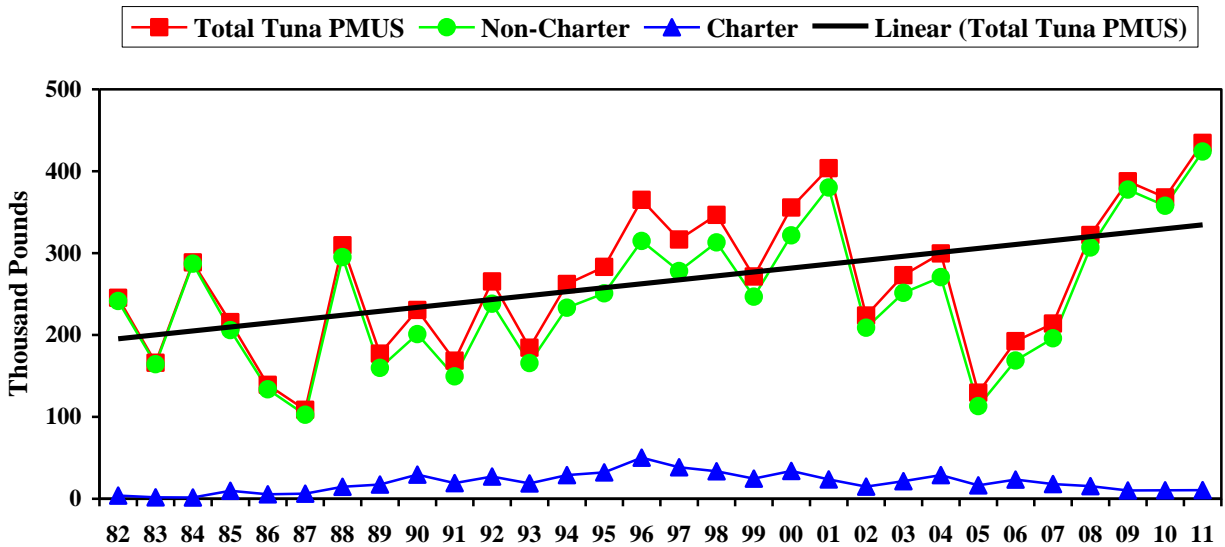
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel survey data.

**Calculation:** A 365-day (366 days during leap years) quarterly expansion is run for each calendar year of survey data to produce catch and effort estimates for trolling. Percent species composition is calculated by weight for the sampled catch for each method to produce catch estimates for each species for the expanded period. The annual catch for all pelagic species and the PMUS separately are summed across all methods to obtain the numbers plotted above.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 1b)**

<b>Year</b>	<b>Total Pelagics</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	447432	438297	9135
1983	450823	445116	5707
1984	424299	401687	22612
1985	477073	432202	44871
1986	381495	359020	22475
1987	338354	307342	31013
1988	827260	743415	83845
1989	505811	434832	70979
1990	559773	434361	125412
1991	737653	586914	150739
1992	528214	409546	118667
1993	548295	416340	131955
1994	545917	438677	107239
1995	781389	614137	167251
1996	935837	698544	237293
1997	759936	589089	170847
1998	841681	719841	121840
1999	632319	553487	78831
2000	614709	519677	95032
2001	754999	680436	74563
2002	534878	486790	48087
2003	514820	458746	56074
2004	694746	588217	106529
2005	301487	242520	58968
2006	510608	443504	67104
2007	562513	484230	78284
2008	550081	499137	50945
2009	719954	665904	54050
2010	738221	676904	61316
2011	588415	563029	25386
<b>Average</b>	<b>593633</b>	<b>511065</b>	<b>82568</b>
<b>Standard Deviation</b>	<b>153666</b>	<b>123208</b>	<b>52615</b>

Figure 1c. Guam Annual Estimated Tuna PMUS Landings:  
Total, Non-Charter, and Charter



**Interpretation:** The general trend of the estimated total tuna landings shows an increasing trend between 1987 and 2001. Non-charter boats account for the bulk of the total tuna catch, up to 95% in the 1980's. This decreased when charter boat activity began increased from the late 1980's until the mid 1990's. In 2011, 97% of tuna were caught by non-charter boats. In 2011, total tuna and non-charter landings increased by 18% and 19% respectively. Charter tuna landings increased by 2% from 2010 totals. The 2011 estimated tuna PMUS landings were the highest in the time series, and 64% higher than the 30 year average.

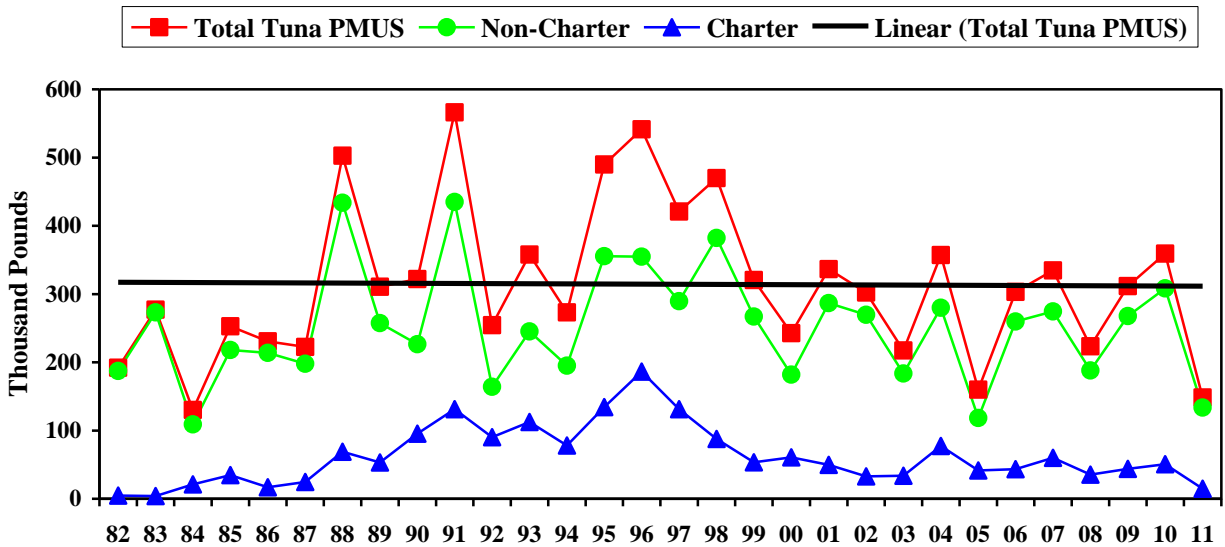
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program, expanded with the assistance of NMFS.

**Calculation:** A 365-day (366 days during leap years) quarterly expansion is run for each calendar year of survey data to produce catch and effort estimates for trolling. Percent species composition is calculated by weight for the sampled catch for each method to produce catch estimates for each species for the expanded period. The annual catch for all pelagic species and the PMUS separately are summed across all methods to obtain the numbers plotted above.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 1c)**

<b>Year</b>	<b>Total Tunas</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	245400	241410	3990
1983	166105	164377	1729
1984	288634	287078	1556
1985	215686	205965	9721
1986	139099	133618	5480
1987	108729	102529	6199
1988	309571	294961	14610
1989	177158	159766	17392
1990	230559	201046	29512
1991	168669	149568	19100
1992	265333	238181	27152
1993	184394	165609	18786
1994	262181	233223	28959
1995	283055	250837	32218
1996	364929	314719	50210
1997	316552	277987	38566
1998	346634	313004	33630
1999	271359	246794	24565
2000	355581	321642	33939
2001	403691	379991	23701
2002	223805	208925	14880
2003	273029	251484	21545
2004	299495	270647	28848
2005	129489	113040	16450
2006	192365	168906	23459
2007	214014	196056	17958
2008	322053	306682	15371
2009	387643	377471	10172
2010	367960	357668	10292
2011	434501	423964	10536
<b>Average</b>	<b>264922</b>	<b>245238</b>	<b>19684</b>
<b>Standard Deviation</b>	<b>84465</b>	<b>81277</b>	<b>11479</b>

**Figure 1d. Guam Annual Estimated Landings:  
Total, Non-Charter, and Charter Non-Tuna PMUS**



**Interpretation:** The estimated total non-tuna PMUS landings showed a general increase between 1984 and 1996, corresponding with an increase in boats entering the fishery. Non-charter trolling trips accounts for the bulk of the other PMUS catch. Up until the mid-1980's, non-charter boats accounted for up to 90% of the non-PMUS species. This percentage began decreasing in the late 1980's when charter fishing activity began increasing, associated with an increase in tourism. Charter PMUS harvest began gradually decreasing after 1996. Non-charter PMUS landings also began decreasing after 1996, but exhibit year to year fluctuations. In 2011, total non-tuna PMUS and non-charter non-tuna PMUS decreased 58% and 57% respectively when compared with 2010. Charter non-tuna PMUS decreased 71%. These decreased levels may be due to the biology of non-tuna PMUS species, primarily mahi mahi. Additionally, poor weather conditions limited the number of fishing days in 2011. Non-charter boats accounted for 90% of non-tuna PMUS catch in 2011.

**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program, expanded with the assistance of NMFS.

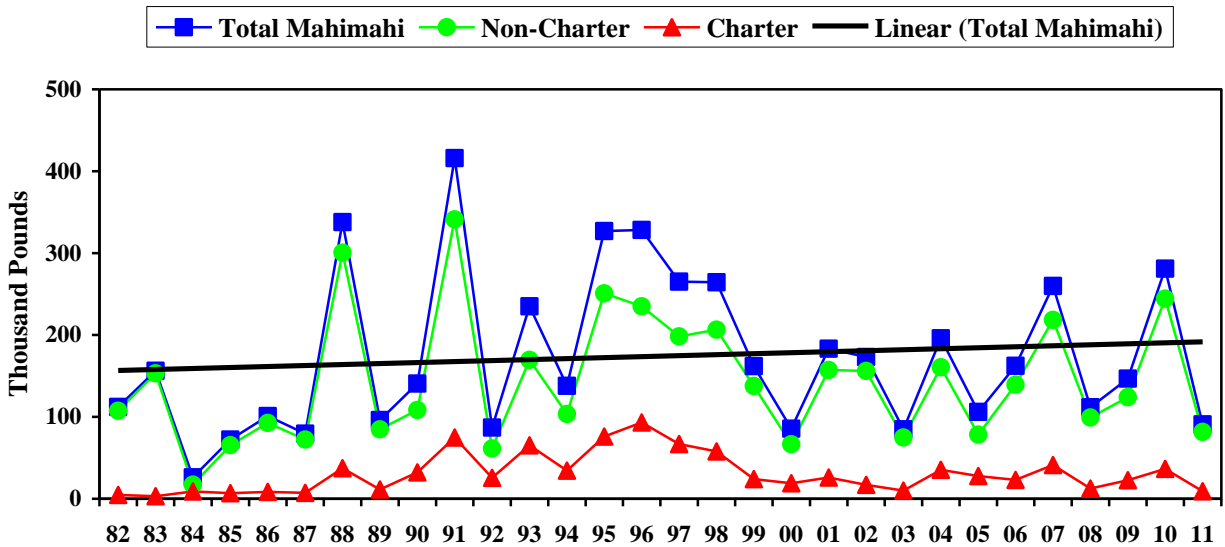
**Calculation:** A 365-day (366 days during leap years) expansion is run for each calendar year of survey data to produce catch and effort estimates for each fishing method surveyed. Percent species composition is calculated by weight for the sampled catch for each method to produce catch estimates for each species for the expanded period. The annual catch for all pelagic species and the PMUS separately are summed across all methods to obtain the numbers plotted above.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 1d)**

<b>Year</b>	<b>Total Non_Tuna PMUS</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	192129	187341	4788
1983	277179	273201	3978
1984	130027	108971	21056
1985	252707	218028	34678
1986	230814	213897	16917
1987	222521	197979	24542
1988	502803	433773	69030
1989	310755	257508	53247
1990	321935	226558	95378
1991	566242	434832	131410
1992	254498	164124	90374
1993	357787	245139	112648
1994	273167	195134	78032
1995	489757	355337	134421
1996	541317	354822	186495
1997	420967	289596	131371
1998	469976	382281	87695
1999	320529	267112	53417
2000	242558	181863	60695
2001	336571	286816	49756
2002	302339	269555	32784
2003	217440	183667	33773
2004	357169	279872	77297
2005	159929	118429	41500
2006	303179	259861	43318
2007	334599	274675	59924
2008	223406	187958	35449
2009	311582	267735	43847
2010	359104	308409	50695
2011	148375	133590	14786
<b>Average</b>	<b>314379</b>	<b>251935</b>	<b>62443</b>
<b>Standard Deviation</b>	<b>111481</b>	<b>81748</b>	<b>42688</b>



**Figure 2a. Guam Annual Estimated Total Mahimahi Landings:  
All Mahimahi, Mahimahi NC, and Mahimahi C**



**Interpretations:** Historically, mahimahi catches have fluctuated wildly, with a good year followed by one or two down years. Catch peaked in 1996, and has been lower since, although still demonstrating the cyclical nature. Non-charter trips account for the bulk of the mahimahi catch, with charter activity harvesting proportionally more beginning in the late 1980's as tourist arrivals to Guam increased. A drop in charter catch corresponds to decreasing tourist arrivals in the late 1990's. In 2011, mahimahi landings decreased, with total and non-charter landings increasing 67% and 67%, respectively. Charter landings decreased by 75%. All three categories are well below the 30 year average.

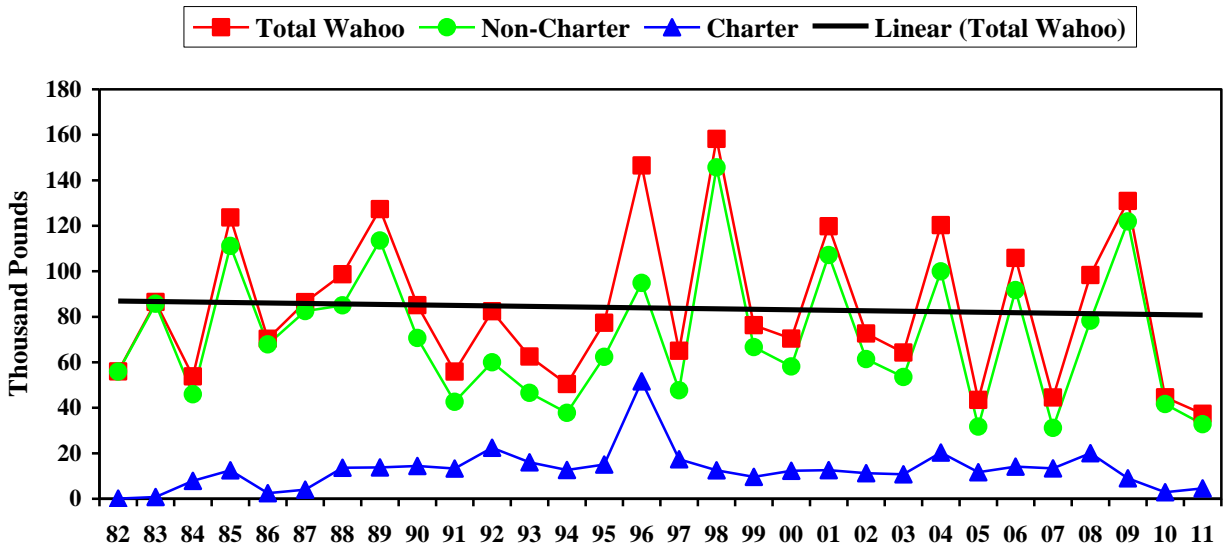
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

**Calculation:** Totals by species are summed across all fishing methods as described in Figures 1a to 1d.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 2a)**

<b>Year</b>	<b>Total Mahimahi</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	112181	107480	4701
1983	156340	153158	3183
1984	26174	17228	8946
1985	72361	65442	6919
1986	101108	92620	8488
1987	79480	72200	7280
1988	337769	300520	37249
1989	96043	84791	11253
1990	140629	108370	32259
1991	415944	341139	74805
1992	86969	61301	25668
1993	234979	169662	65317
1994	138014	103648	34367
1995	326979	250910	76069
1996	328315	235144	93170
1997	265157	198344	66813
1998	264421	206592	57830
1999	161936	137811	24126
2000	85561	66575	18986
2001	183278	157293	25986
2002	173130	156172	16958
2003	84739	74766	9973
2004	195935	160543	35392
2005	106178	78394	27784
2006	162393	139246	23147
2007	259828	218521	41307
2008	111811	99331	12480
2009	146649	124061	22588
2010	280963	244374	36589
2011	90888	81642	9246
<b>Average</b>	<b>174205</b>	<b>143576</b>	<b>30629</b>
<b>Average</b>	<b>95038</b>	<b>75935</b>	<b>23829</b>

**Figure 2b. Guam Annual Estimated Total Wahoo Landings:  
All Wahoo, Wahoo NC, and Wahoo**



**Interpretations:** The wide fluctuations in wahoo landings are probably due to the high variability in the year-to-year abundance and availability of the stocks. Until 1987, non-charter landings accounted for over 95% of the total catch. In 1988, this percentage decreased due to an increase in charter boat activity. In 1996, wahoo charter landings peaked, accounting for 35% of the total catch. In 2011, total and non-charter, harvest of wahoo decreased 16.2% and 21.3%, respectively, while charter wahoo catch increased by 57% from 2010. Non-charter boats harvested 88% of the total wahoo harvest. The total wahoo catch was 55% below the 30 year average, and is the lowest total in the time series.

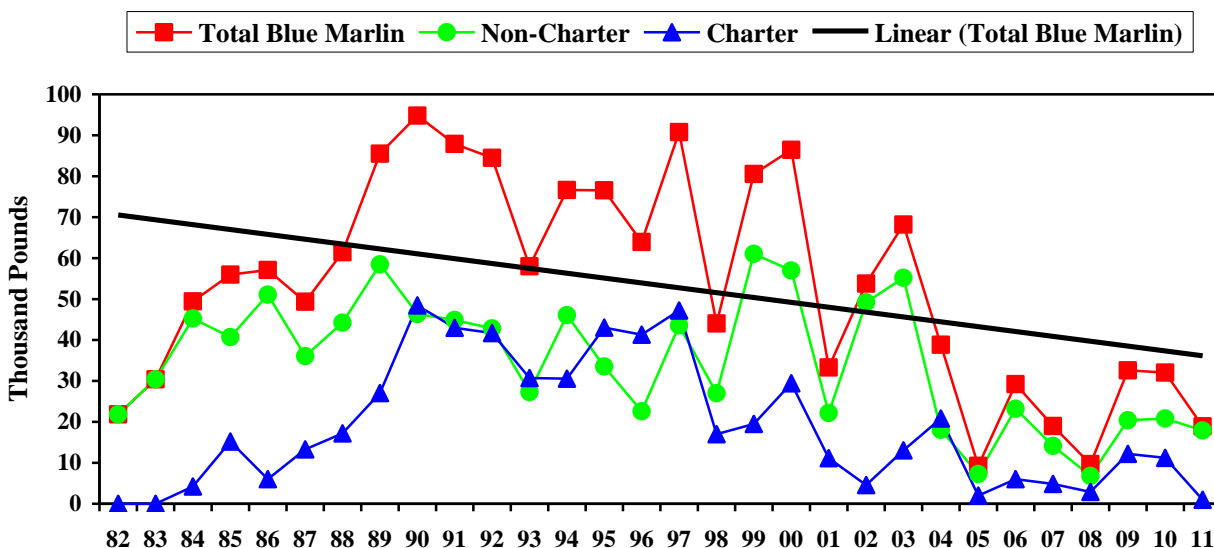
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

**Calculation:** Totals by species are summed across all fishing methods as described in Figures 1a to 1d.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 2b)**

<b>Year</b>	<b>Total Wahoo</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	55993	55906	87
1983	86530	85735	795
1984	53804	45900	7905
1985	123685	111144	12540
1986	70337	67909	2428
1987	86465	82477	3989
1988	98679	85006	13673
1989	127325	113557	13768
1990	85108	70710	14398
1991	55926	42633	13293
1992	82446	60003	22444
1993	62550	46532	16018
1994	50457	37766	12691
1995	77391	62365	15026
1996	146521	94896	51624
1997	65034	47693	17341
1998	158194	145659	12535
1999	76338	66673	9665
2000	70433	58157	12277
2001	119765	107150	12616
2002	72643	61386	11257
2003	64266	53505	10761
2004	120266	99941	20325
2005	43443	31739	11704
2006	105878	91713	14166
2007	44528	31166	13362
2008	98345	78274	20071
2009	130903	121868	9035
2010	44572	41670	2902
2011	37354	32809	4545
<b>Average</b>	<b>83839</b>	<b>71065</b>	<b>12775</b>
<b>Standard Deviation</b>	<b>32109</b>	<b>29137</b>	<b>9066</b>

Figure 3a. Guam Annual Estimated Total Blue Marlin Landings:  
All Blue Marlin, Blue Marlin NC, and Blue Marlin C



**Interpretations:** During the 1980's, non-charter boats accounted for the bulk of the blue marlin catch. In the early 1990's, charters share of the marlin catch began to increase, peaking at 64% in 1996. The increases were due to an increase in charter boat activity and the active targeting of blue marlin by charter boats during the summer months. The decrease in charter landings after 1997 corresponded to the decrease in tourist charter trips. In 2011, all categories of marlin catch decreased. Total catch was down 41%, non- charter catch was down 14%, and charter catch was down 91% Charter blue marlin catch accounted for 5% of the total blue marlin harvest. Blue marlin landings were below the 30 year average in all categories. The charter total is the lowest in the time series.

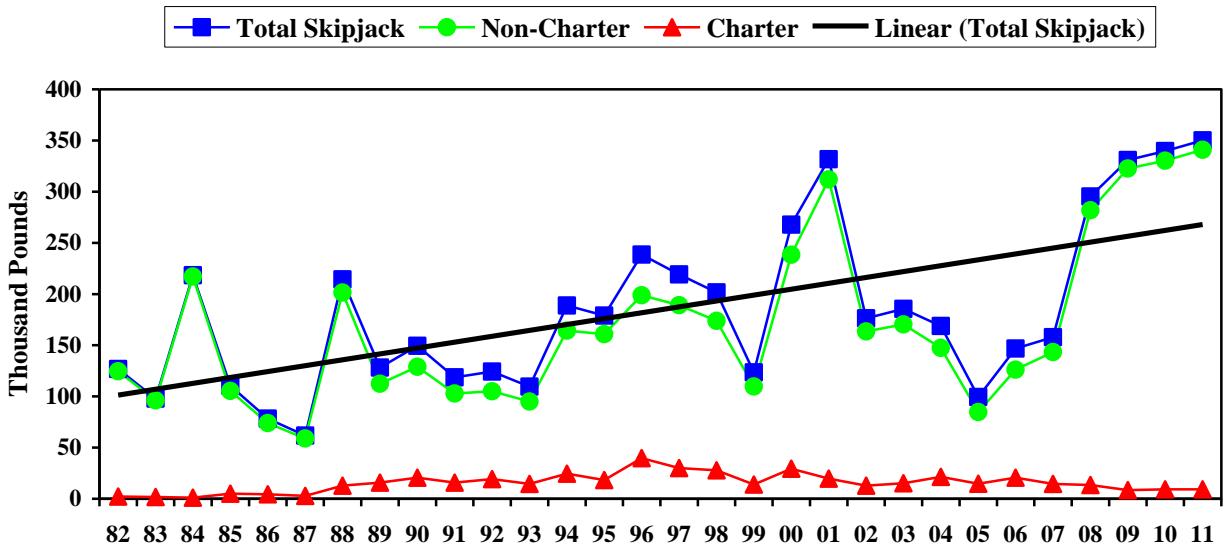
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

**Calculation:** Totals by species are summed across all fishing methods as described in Figures 1a to 1d.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 3a)**

<b>Year</b>	<b>Total Blue Marlin</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	21845	21845	0
1983	30402	30402	0
1984	49438	45233	4205
1985	55945	40726	15219
1986	57076	51074	6002
1987	49360	36087	13274
1988	61427	44242	17185
1989	85515	58477	27038
1990	94798	46344	48455
1991	87869	44899	42970
1992	84498	42810	41688
1993	57992	27280	30713
1994	76633	46057	30576
1995	76569	33535	43034
1996	63919	22602	41318
1997	90777	43559	47217
1998	44026	27009	17017
1999	80537	61032	19505
2000	86424	56992	29432
2001	33302	22148	11154
2002	53761	49191	4569
2003	68204	55165	13039
2004	38845	18036	20809
2005	9270	7258	2012
2006	29222	23217	6005
2007	18994	14148	4846
2008	9704	6807	2898
2009	32605	20411	12194
2010	32042	20838	11204
2011	18895	17901	994
<b>Average</b>	<b>53330</b>	<b>34511</b>	<b>18819</b>
<b>Standard Deviation</b>	<b>25561</b>	<b>15329</b>	<b>15377</b>

**Figure 4a. Guam Annual Estimated Total Skipjack Landings:  
All Skipjack, Skipjack NC, and Skipjack C**



**Interpretations:** Skipjack tuna catch has fluctuated over the reporting period, reaching a high point in 2001. A drop in skipjack tuna during 2002 may be due to direct hits by two super typhoons. The reason for the high numbers of 2001 is not clear. It could have to do with the biology of the species. An increasing catch in skipjack tuna since 2007 reflects an increase in small boats targeting this species. These boats are primarily crewed by Micronesian fishermen.

Total skipjack tuna landings and non-charter landings increased in 2011 by 3% and 3% respectively, while charter landings decreased by .3%. Total catch is 89.7% above the 30-year average, and is the highest total in the time series.

**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

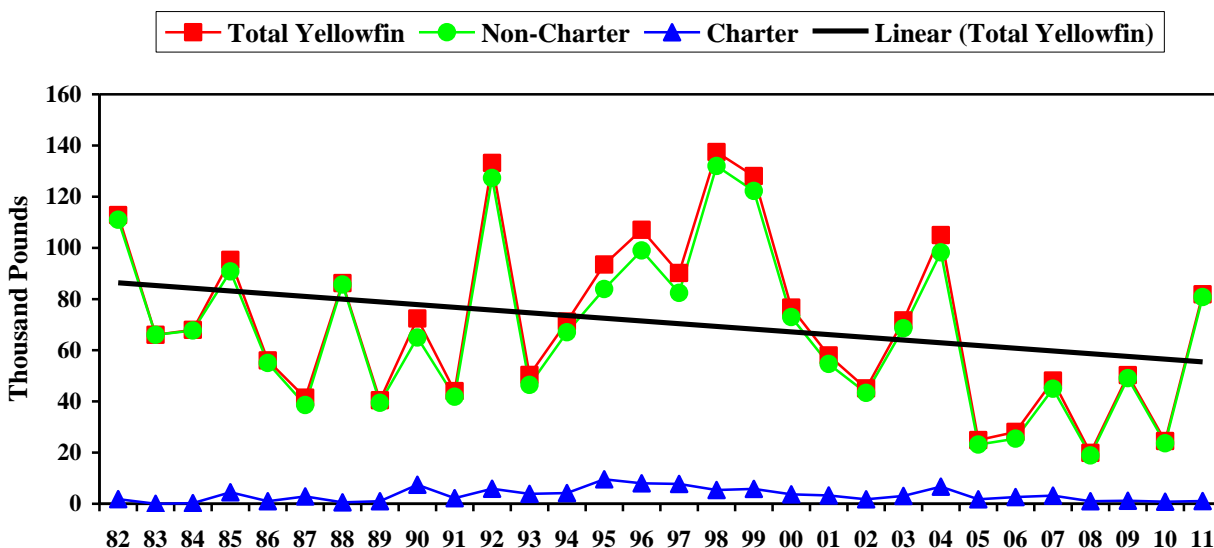
**Calculation:** Totals by species are summed across all fishing methods as described in Figures 1a to 1d.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 4a)**

<b>Year</b>	<b>Total Skipjack</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	126825	124649	2176
1983	97802	96142	1660
1984	218307	217152	1155
1985	110303	105359	4944
1986	78283	73878	4405
1987	61806	58948	2858
1988	214328	201561	12766
1989	128209	112364	15845
1990	149502	128910	20592
1991	118708	102845	15862
1992	124344	105088	19257
1993	109582	95081	14502
1994	188784	164288	24496
1995	179036	160771	18265
1996	238583	198888	39695
1997	219177	189211	29966
1998	201659	173892	27767
1999	123538	109696	13841
2000	267699	238330	29368
2001	331768	312001	19767
2002	176356	163504	12852
2003	185575	170352	15223
2004	168838	147447	21391
2005	99391	84762	14629
2006	146776	126160	20616
2007	157861	143332	14529
2008	295250	281827	13423
2009	330955	322574	8381
2010	339596	330310	9286
2011	350193	340934	9259
<b>Average</b>	<b>184634</b>	<b>169342</b>	<b>15293</b>
<b>Standard Deviation</b>	<b>80494</b>	<b>78904</b>	<b>9066</b>



**Figure 4b. Guam Annual Estimated Total Yellowfin Landings:  
All Yellowfin, Yellowfin NC, and Yellowfin C**



**Interpretations:** The overall yellowfin landings show wide fluctuations during the 30-year time series, although the total and non-charter estimated landings showed a significant decrease from 1998 to 2002. Charter landings of yellowfin tuna peaked in 1985, 1990, and 1995, and then showed a general decrease until 2002. Yellowfin tuna catch was up significantly in 2011, with total catch, non-charter catch, and charter catch up 234%, 241%, and 24.7%, respectively. Non-charter boats harvested 98.7% of the total yearly catch of yellowfin. Total catch and non-charter catch are above their 30-year averages, while the charter total is well below the average for the time series. An increase in the number of vessels targeting small tuna may be the source of the increased catch totals.

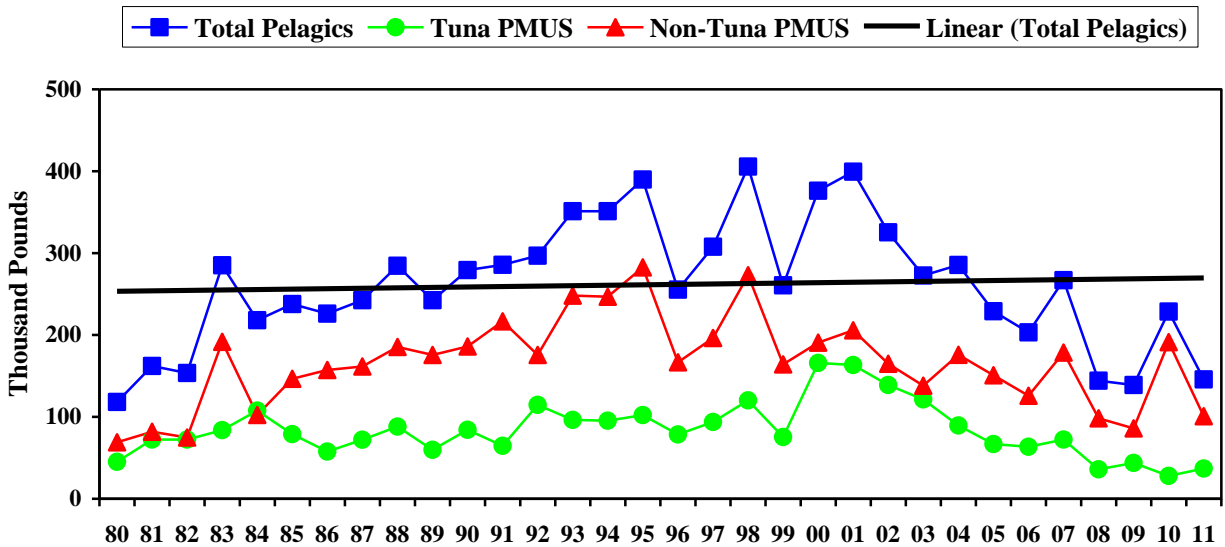
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

**Calculation:** Totals by species are summed across all fishing methods for all years except 1992-93 as described in Figure 1.

**Boat-based Creel Estimated Total Landings (Pounds)**  
**(data for Figure 4b)**

<b>Year</b>	<b>Total Yellowfin</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	112794	110981	1813
1983	65996	65996	0
1984	67975	67710	266
1985	95273	90778	4495
1986	56024	55035	989
1987	41444	38561	2883
1988	86251	85682	569
1989	40457	39453	1004
1990	72394	64942	7452
1991	44034	41822	2212
1992	133170	127311	5859
1993	50350	46444	3906
1994	71221	67022	4199
1995	93495	83913	9582
1996	107038	99005	8033
1997	90167	82408	7759
1998	137422	132020	5402
1999	128026	122204	5822
2000	76651	72967	3684
2001	57929	54668	3261
2002	45089	43336	1753
2003	71626	68573	3053
2004	104954	98255	6700
2005	24884	23130	1754
2006	28049	25419	2630
2007	48118	44934	3184
2008	19888	18900	987
2009	50279	49065	1214
2010	24502	23659	843
2011	81815	80763	1051
<b>Average</b>	<b>70911</b>	<b>67499</b>	<b>3530</b>
<b>Standard Deviation</b>	<b>32318</b>	<b>30900</b>	<b>2533</b>

**Figure 5. Guam Annual Estimated Commercial Landings:  
All Pelagics, Tuna PMUS, and Non-tuna PMUS**



**Interpretations:** Commercial pelagic fishery landings have shown a general increase for the first 20 years in the 30-year time series. In 2002, the estimated commercial landings decreased overall by 17%, with a 15% decrease for tuna landings and a 20% decrease for landings of other PMUS, possibly due to direct hits by two super typhoons, resulting in boat damage, lack of tourist for the commercial charter boats, and unavailability of ice for fishermen. Total commercial catch decreased 36% from 2010. Total commercial catch is 44% below the 30 year average.

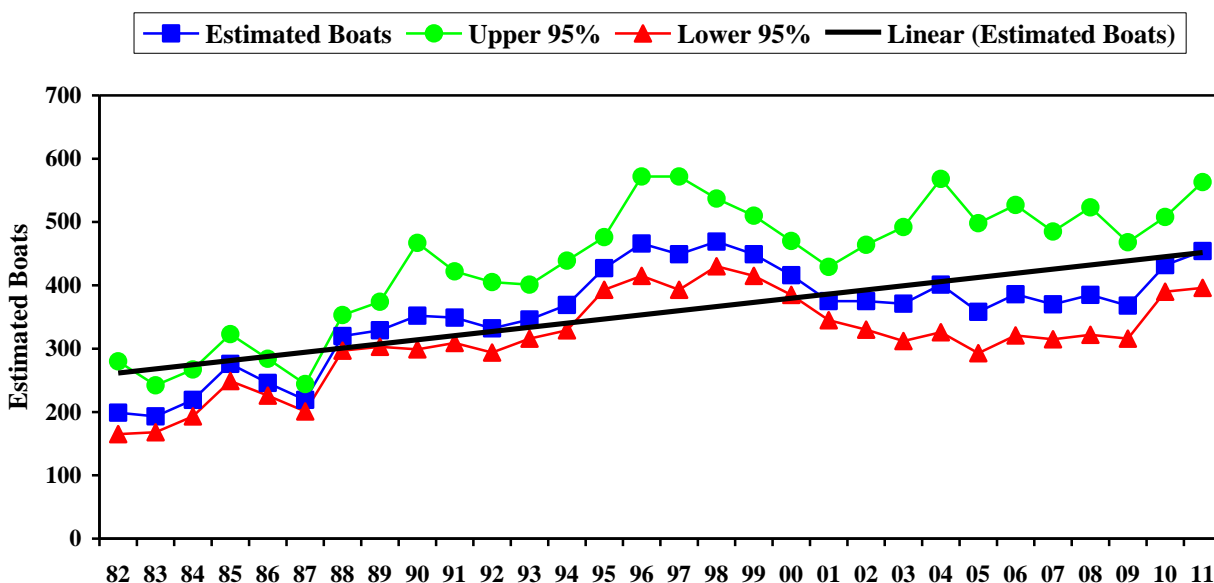
**Source:** The WPACFIN-sponsored commercial landings system.

**Calculation:** Total commercial landings were estimated by summing the weight fields in the commercial landings database from the principle fish wholesalers on Guam, and then multiplying by an estimated percent coverage expansion factor. The annual expansion factor was subjectively created based on as much information as possible depending on the year, including: an analysis of the "disposition of catch" data available from the DAWR offshore creel survey; an evaluation of the fishermen in the fishery and their entry/exit patterns; general "dock side" knowledge of the fishery and the status of the marketing conditions and structure; the overall number of records in the data base; and a certain measure of best guesses.

**Commercial Receipt Book Estimated Total Landings (Pounds)  
(data for Figure 5)**

<b>Year</b>	<b>All Pelagic</b>	<b>Tuna PMUS</b>	<b>Non-Tuna PMUS</b>
1980	118251	45043	69062
1981	162186	72229	81808
1982	153577	72347	74832
1983	285118	83764	191676
1984	218028	107568	102398
1985	237695	79028	146477
1986	226138	57689	157377
1987	242444	72004	161657
1988	284408	88093	185451
1989	242554	59825	175667
1990	279121	84176	185934
1991	285696	64694	216611
1992	296809	114765	175751
1993	351201	96289	248070
1994	351187	95321	246860
1995	389849	102236	282468
1996	255281	78636	166702
1997	307764	93825	196335
1998	405666	120186	272882
1999	260669	75346	164082
2000	376192	165898	190761
2001	399471	163369	205648
2002	325299	139009	164853
2003	272633	121326	138160
2004	285545	89479	175777
2005	228936	66804	150770
2006	203139	63579	125847
2007	266964	72271	178660
2008	144110	36009	98207
2009	138854	43760	86040
2010	228620	27935	191275
2011	145755	36939	100873
<b>Average</b>	<b>261536</b>	<b>84045</b>	<b>165905</b>
<b>Standard Deviation</b>	<b>77049</b>	<b>32995</b>	<b>54089</b>

Figure 6. Guam Estimated Number of Trolling Boats



**Interpretations:** Since 1982, the general trend on Guam has been an increase in the number of boats participating in the pelagic fishery, especially since the addition of two marinas to the offshore sampling program. There appears to be a general increase in the number of small boats participating in Guam's pelagic fishery, while the number of charter vessels has remained fairly constant for several years. In 2011, the number of boats was 454, an increase of 5% from 2010.

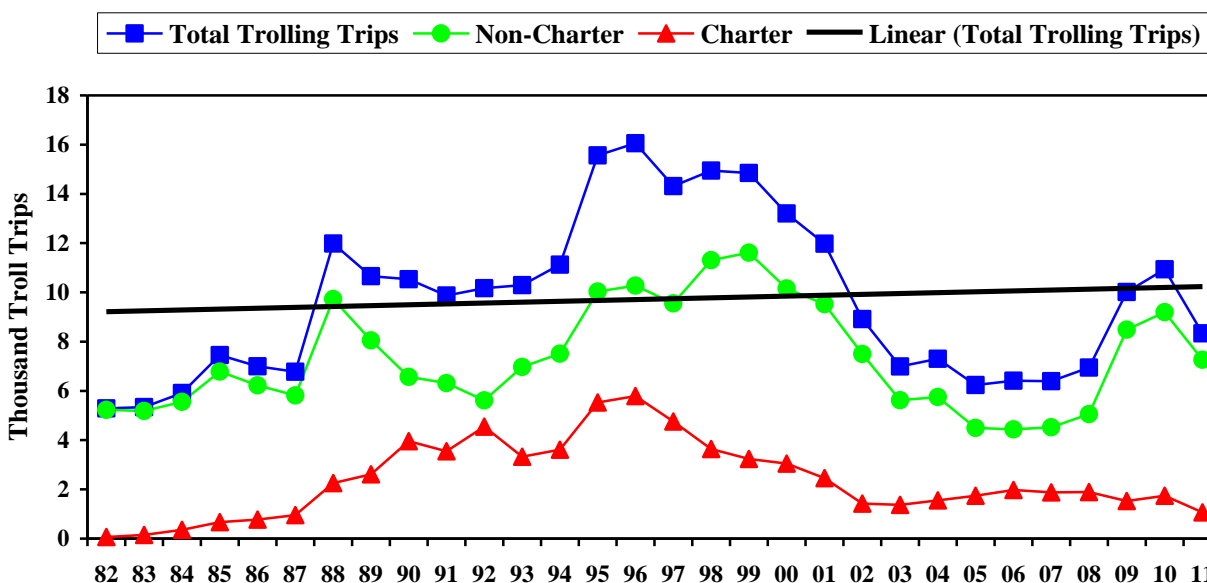
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

**Calculation:** Since only a fraction of the days of the year are sampled, it is not possible to know the exact number of boats participating in the fishery. The 2011 trolling boat log was converted and processed through a boat estimator model 1,000 times.

**Estimated Number of Trolling Boats from Boat-based Creel  
(data for Figure 6)**

<b>Year</b>	<b>Estimated Boat</b>	<b>Upper 95%</b>	<b>Lower 95%</b>
1982	199	280	165
1983	193	242	168
1984	219	267	193
1985	276	323	249
1986	246	284	226
1987	219	244	201
1988	320	353	297
1989	329	374	303
1990	352	467	299
1991	349	422	309
1992	332	405	294
1993	346	401	316
1994	369	439	329
1995	427	476	393
1996	466	572	415
1997	449	572	393
1998	469	537	430
1999	449	510	415
2000	416	470	385
2001	375	429	345
2002	375	464	330
2003	371	492	312
2004	401	568	326
2005	358	498	293
2006	386	527	321
2007	370	485	315
2008	385	523	322
2009	368	468	316
2010	432	508	390
2011	454	563	396

Figure 7a. Guam Estimated Number of Trolling Trips



**Interpretations:** Non-charter and charter troll trips generally increased for the first 15 years of the 26-year time series. The number of troll trips began to decline in 1999, due to a number of factors including a continuing economic recession on the island, a decline in Asian visitors for charter boats, and an increase in cost to maintain, repair, and fuel boats for the average fishermen compared with fish caught for sale to make up for expenses. In 2011, the total number of troll trips decreased by 23.8%, and the number of non-charter trips decreased by 21%. The number of charter trips decreased by 39%. The decrease in non-charter trips may be attributed to an increase in gas prices, as well as an exceptionally high number of bad weather days during 2011. Total trips are 14% below the 30 year average.

**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files.

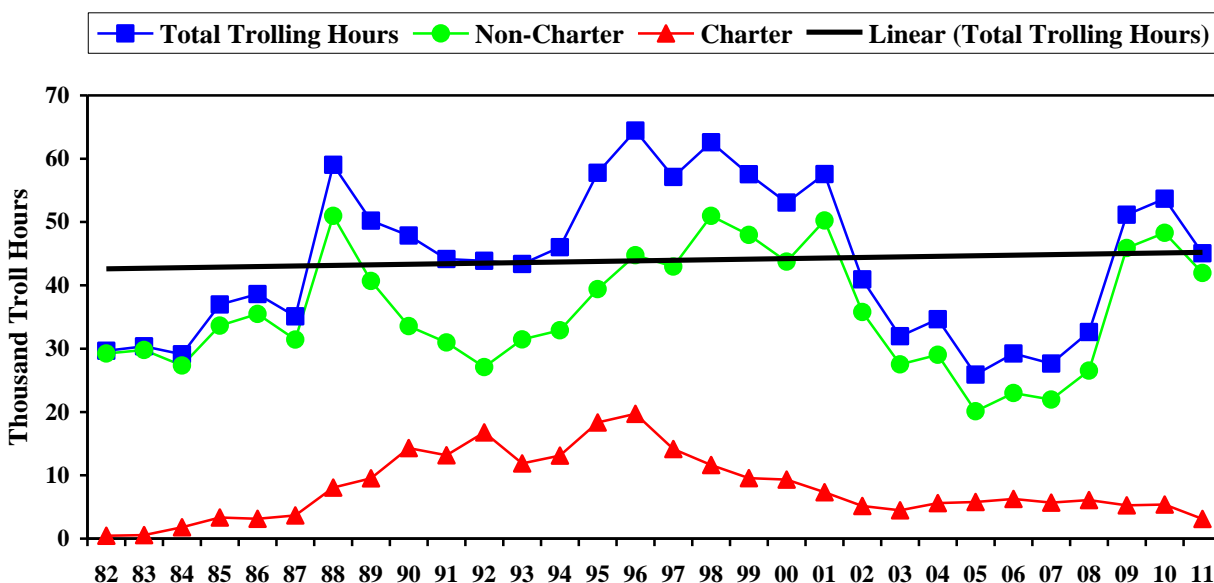
**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method surveyed. These plots are of the estimated number of trips for the trolling method as taken directly from creel survey expansion system printouts.

**Boat-based Creel Estimated of Trolling Trips  
(data for Figure 7a)**

<b>Year</b>	<b>Estimated Trips</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	5292	5230	62
1983	5339	5187	151
1984	5913	5554	359
1985	7454	6783	671
1986	6999	6227	772
1987	6776	5818	958
1988	11981	9727	2254
1989	10660	8049	2612
1990	10531	6571	3960
1991	9868	6317	3550
1992	10167	5617	4551
1993	10295	6971	3324
1994	11125	7515	3610
1995	15562	10030	5532
1996	16060	10274	5787
1997	14313	9555	4758
1998	14944	11304	3641
1999	14848	11610	3239
2000	13203	10154	3049
2001	11977	9522	2456
2002	8917	7497	1420
2003	6991	5622	1368
2004	7307	5754	1553
2005	6238	4495	1743
2006	6414	4440	1973
2007	6395	4520	1875
2008	6947	5057	1891
2009	10014	8488	1526
2010	10935	9193	1743
2011	8336	7268	1068
<b>Average</b>	<b>9727</b>	<b>7345</b>	<b>2382</b>
<b>Standard Deviation</b>	<b>3210</b>	<b>2117</b>	<b>1522</b>



Figure 7b. Guam Estimated Number of Trolling Hours



**Interpretations:** Trolling hours for non-charters and charters have generally increased over the past 20 years. Beginning in 1996, charter troll hours began to decrease. This corresponded to a downturn in Asian economies, which resulted in fewer charter trolling hours. After 2001, charter activity dropped off dramatically. Tourism was also down, due to the 9/11 attacks, the SARS scare, and two typhoons striking Guam in 2002. Since 2005, the number of hours trolling has generally been increasing. In 2011, however, total and non-charter totals decreased by 16% and 13%, respectively, while charter hours decreased by 42%. The decrease in hours trolling may be attributed higher gas prices and a high number of bad weather days in 2011. Total hours trolling is 13% below the 30-year average.

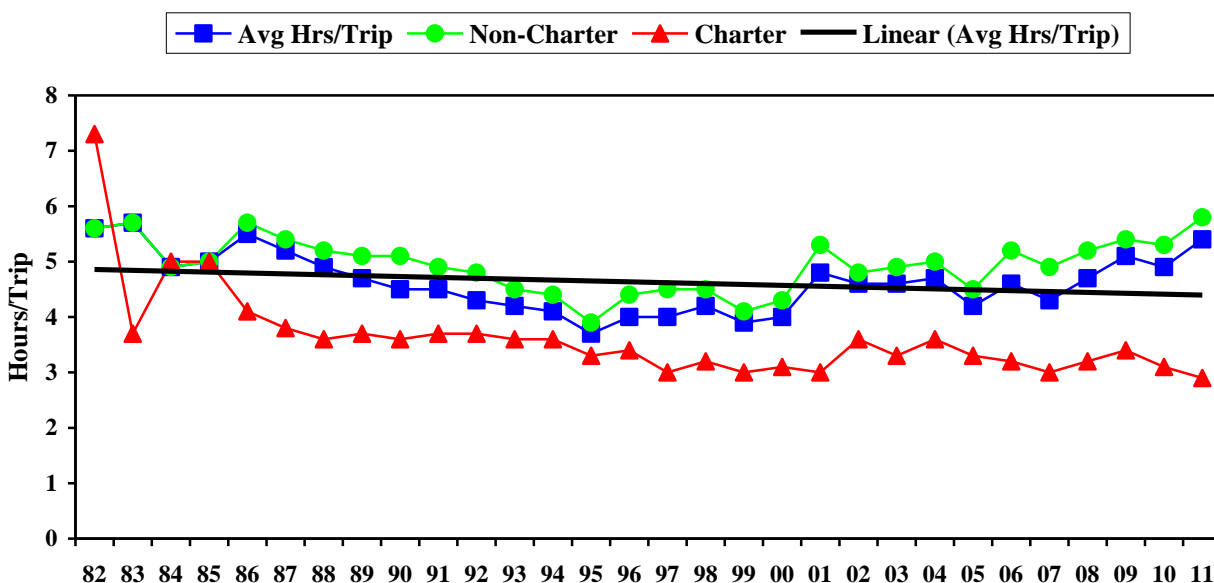
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files.

**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method surveyed. These plots are of the estimated boat hours spent fishing for the trolling method as taken directly from creel survey expansion system printouts.

**Boat-based Creel Estimated of Trolling Hours**  
**(data for Figure 7b)**

<b>Year</b>	<b>Estimated Hours</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	29678	29226	453
1983	30363	29803	560
1984	29115	27332	1783
1985	36967	33630	3337
1986	38621	35489	3132
1987	35112	31441	3671
1988	59043	50971	8073
1989	50220	40685	9535
1990	47865	33567	14298
1991	44136	30981	13155
1992	43865	27080	16785
1993	43354	31465	11889
1994	46017	32903	13113
1995	57767	39409	18359
1996	64452	44748	19704
1997	57122	42965	14157
1998	62584	50969	11614
1999	57533	47973	9560
2000	53072	43743	9329
2001	57572	50231	7341
2002	40950	35787	5162
2003	31974	27511	4463
2004	34635	29026	5608
2005	25903	20116	5786
2006	29250	22987	6263
2007	27644	21955	5689
2008	32624	26538	6087
2009	51145	45890	5255
2010	53667	48295	5372
2011	45053	41944	3108
<b>Average</b>	<b>43910</b>	<b>35822</b>	<b>8088</b>
<b>Standard Deviation</b>	<b>11487</b>	<b>9041</b>	<b>5110</b>

Figure 7c. Guam Estimated Number of Trip Length



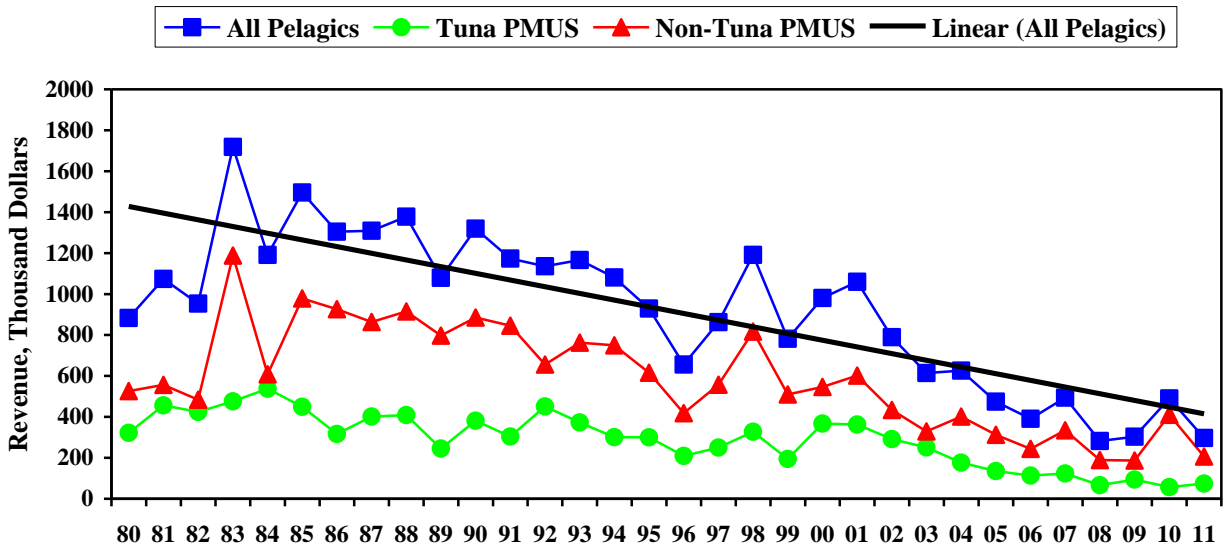
**Interpretations:** The overall average trolling trip decreased slightly from 2009. The redeployment of fish aggregating devices (FADs) still provide charter boats and non-charter fishermen with a prescribed route for trolling activity, although many boats have been observed to be making longer trips to the banks located north and south of Guam. Overall trolling trip length appears to have remained fairly constant throughout the 30-year time series. In 2011, total and non-charter categories showed an increase, with the average number of hours per trip up 10%. This is 17% higher than the 30 year average. **Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files.

**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method surveyed. These plots are of the estimated boat hours spent fishing and number of trips for the trolling method, as taken directly from creel survey, expansion system printouts.

**Boat-based Creel Estimated of Trip Length (Hours/trip)**  
**(data for Figure 7c)**

<b>Year</b>	<b>Estimated Trips</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	5.6	5.6	7.3
1983	5.7	5.7	3.7
1984	4.9	4.9	5.0
1985	5.0	5.0	5.0
1986	5.5	5.7	4.1
1987	5.2	5.4	3.8
1988	4.9	5.2	3.6
1989	4.7	5.1	3.7
1990	4.5	5.1	3.6
1991	4.5	4.9	3.7
1992	4.3	4.8	3.7
1993	4.2	4.5	3.6
1994	4.1	4.4	3.6
1995	3.7	3.9	3.3
1996	4.0	4.4	3.4
1997	4.0	4.5	3.0
1998	4.2	4.5	3.2
1999	3.9	4.1	3.0
2000	4.0	4.3	3.1
2001	4.8	5.3	3.0
2002	4.6	4.8	3.6
2003	4.6	4.9	3.3
2004	4.7	5.0	3.6
2005	4.2	4.5	3.3
2006	4.6	5.2	3.2
2007	4.3	4.9	3.0
2008	4.7	5.2	3.2
2009	5.1	5.4	3.4
2010	4.9	5.3	3.1
2011	5.4	5.8	2.9
<b>Average</b>	<b>4.6</b>	<b>4.9</b>	<b>3.6</b>
<b>Standard Deviation</b>	<b>0.5</b>	<b>0.5</b>	<b>0.8</b>

**Figure 8. Guam Annual Estimated Inflation-Adjusted Commercial Revenues:  
All Pelagics, Tuna PMUS, and Non-Tuna PMUS**



**Interpretations:** The estimated inflation-adjusted commercial revenues for 2009 increased 7% for total, 42% for tuna PMUS, and decreased 1.4% for non-tuna PMUS. Overall, commercial revenues have shown a gradual decrease since the early 1980's. A large drop occurring after 2002 can partly be attributed to two typhoons striking Guam, as well as a change in government policy (see introduction). This trend somewhat continued in 2011, with all three adjusted revenue categories well below the 30-year averages.

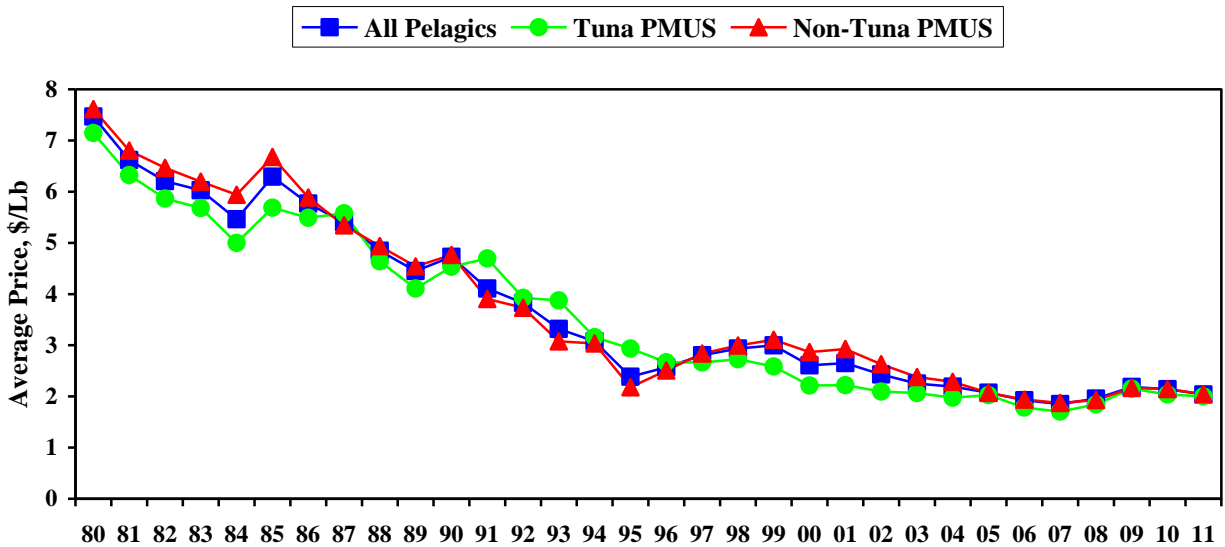
**Source:** The WPACFIN-sponsored commercial landings system.

**Calculation:** Commercial revenues were estimated by summing the revenue fields in the commercial landings database from the principle fish wholesalers on Guam, and then multiplying by the same percent coverage expansion factor, as in figure 5. Inflation-adjusted total revenue per trip is derived from the Guam Annual Consumer Price Index (CPI).

**Inflation-Adjusted Commercial Revenues (\$)**  
**from Commercial Receipt Books (data for Figure 8)**

	<b>All Pelagics</b>		<b>Tuna PMUS</b>		<b>Non-Tuna PMUS</b>	
<b>Year</b>	<b>Unadjusted</b>	<b>Adjusted</b>	<b>Unadjusted</b>	<b>Adjusted</b>	<b>Unadjusted</b>	<b>Adjusted</b>
1980	149124	883111	54353	321876	88775	525728
1981	218384	1073577	92914	456767	113212	556552
1982	203847	953190	90719	424202	103459	483774
1983	380231	1718262	105308	475887	262817	1187670
1984	286490	1190939	129389	537871	146339	608333
1985	373796	1495930	112286	449367	244423	978182
1986	334955	1304650	81299	316661	237826	926333
1987	350828	1308939	107642	401613	231451	863543
1988	388630	1378081	115243	408653	258203	915589
1989	337586	1079262	76865	245739	249421	797397
1990	471241	1319005	136321	381562	316491	885858
1991	462191	1173502	119640	303766	333096	845731
1992	492707	1135690	195547	450735	284546	655879
1993	547835	1165794	175360	373167	358592	763084
1994	593838	1080786	165296	300838	411832	749534
1995	537889	929472	173629	300032	356256	615611
1996	398375	655726	127375	209659	254063	418188
1997	534352	862979	154819	250033	344972	557129
1998	733101	1191289	201639	327663	502801	817052
1999	489605	781410	122023	194749	319342	509670
2000	626803	980946	234735	367361	349312	546673
2001	667648	1059557	228652	362870	379174	601749
2002	500777	789725	184705	291280	274929	433564
2003	399989	613983	163423	250854	214143	328710
2004	432735	626167	122098	176676	277544	401607
2005	353131	474608	100720	135368	232336	312260
2006	324686	390922	94040	113225	202560	243882
2007	437861	493907	109201	123179	296385	334322
2008	260474	281832	61360	66392	174973	189321
2009	286514	303419	88918	94164	176071	186459
2010	474481	489664	55183	56949	397710	410437
2011	297309	297309	73945	73945	206200	206200
<b>Average</b>	<b>417107</b>	<b>921363</b>	<b>126708</b>	<b>288847</b>	<b>268727</b>	<b>589251</b>
<b>Standard Deviation</b>	<b>134016</b>	<b>369347</b>	<b>47826</b>	<b>131753</b>	<b>92662</b>	<b>253670</b>

**Figure 9. Guam Annual Estimated Inflation-Adjusted Average Price of:  
All Pelagics, Tuna PMUS, and Non-tuna PMUS**



**Interpretations:** The inflation-adjusted price of tuna and other non-tuna PMUS has shown a dramatic decline since data on the pelagic fishery was first collected in 1980. In 2007, the trend started to change slightly. In 2011, prices were virtually unchanged, with the adjusted price for all pelagics decreasing 4.7%, 2% for tuna PMUS, and 5% for non-tuna PMUS species. All three categories are well below their 30 year averages. Locally caught pelagic fish continues to have to compete with cheaper pelagic fish caught by longliners. These are value-added products sold at several supermarkets and roadside vendors.

**Source:** The WPACFIN-sponsored commercial landings system.

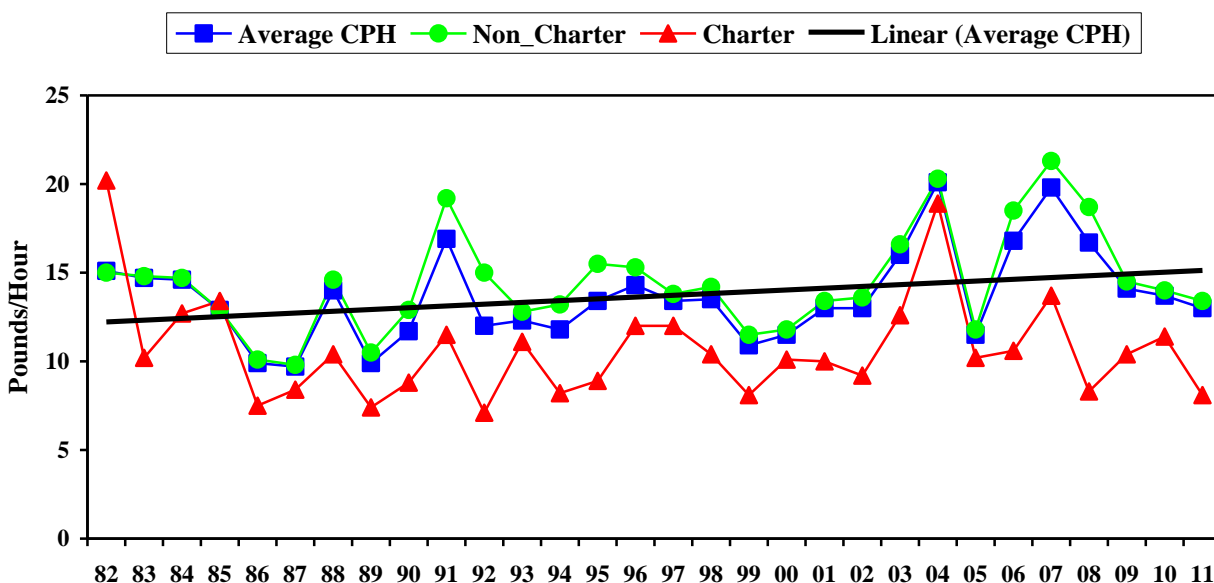
**Calculation:** The average price of the Tunas and other PMUS groups are calculated by dividing the total revenue for each by the sold weight. The inflation adjustment is made by using the Consumer Price Index (CPI) for Guam and establishing the current year figure as the base from which to calculate expansion factors for all previous years (e.g., divide the current year CPI by the CPI of any given year), and then multiplying that factor by the unadjusted average price for the given year.

**Inflation-Adjusted Average Price (\$/Pounds)  
from Commercial Receipt Books (data for Figure 9)**

	All Pelagics		Tuna PMUS		Non-Tuna PMUS	
Year	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
1980	1.26	7.47	1.21	7.15	1.29	7.61
1981	1.35	6.62	1.29	6.32	1.38	6.80
1982	1.33	6.21	1.25	5.86	1.38	6.46
1983	1.33	6.03	1.26	5.68	1.37	6.20
1984	1.31	5.46	1.20	5.00	1.43	5.94
1985	1.57	6.29	1.42	5.69	1.67	6.68
1986	1.48	5.77	1.41	5.49	1.51	5.89
1987	1.45	5.40	1.49	5.58	1.43	5.34
1988	1.37	4.85	1.31	4.64	1.39	4.94
1989	1.39	4.45	1.28	4.11	1.42	4.54
1990	1.69	4.73	1.62	4.53	1.70	4.76
1991	1.62	4.11	1.85	4.70	1.54	3.90
1992	1.66	3.83	1.70	3.93	1.62	3.73
1993	1.56	3.32	1.82	3.88	1.45	3.08
1994	1.69	3.08	1.73	3.16	1.67	3.04
1995	1.38	2.38	1.70	2.93	1.26	2.18
1996	1.56	2.57	1.62	2.67	1.52	2.51
1997	1.74	2.80	1.65	2.66	1.76	2.84
1998	1.81	2.94	1.68	2.73	1.84	2.99
1999	1.88	3.00	1.62	2.58	1.95	3.11
2000	1.67	2.61	1.41	2.21	1.83	2.87
2001	1.67	2.65	1.40	2.22	1.84	2.93
2002	1.54	2.43	1.33	2.10	1.67	2.63
2003	1.47	2.25	1.35	2.07	1.55	2.38
2004	1.52	2.19	1.36	1.97	1.58	2.28
2005	1.54	2.07	1.51	2.03	1.54	2.07
2006	1.60	1.92	1.48	1.78	1.61	1.94
2007	1.64	1.85	1.51	1.70	1.66	1.87
2008	1.81	1.96	1.70	1.84	1.78	1.93
2009	2.06	2.19	2.03	2.15	2.05	2.17
2010	2.08	2.14	1.98	2.04	2.08	2.15
2011	2.04	2.04	2.00	2.00	2.04	2.04
<b>Average</b>	<b>1.60</b>	<b>3.67</b>	<b>1.54</b>	<b>3.54</b>	<b>1.62</b>	<b>3.74</b>
<b>Standard Deviation</b>	<b>0.21</b>	<b>1.66</b>	<b>0.23</b>	<b>1.60</b>	<b>0.22</b>	<b>1.73</b>



Figure 10a. Guam Trolling Catch Rates (Lbs/Hr):



**Interpretations:** The fluctuations in CPUE are probably due to variability in the year-to-year abundance and availability of the stocks. However, since it is not possible to allocate species-specific effort, effort used to target other species can also result in artificially high or low catch rates for a given species. This is especially true with charter boats targeting blue marlin during the summer months. In 2011, total overall, and non-charter catch rates decreased 5.1% and 4.3%, respectively. Charter catch rates decreased by 29%. Charter catch rates have generally been lower than catch rates of non-charter boats, probably due to their shorter fishing time, and non-charter boats beginning earlier in the morning and ending as late as early evening.

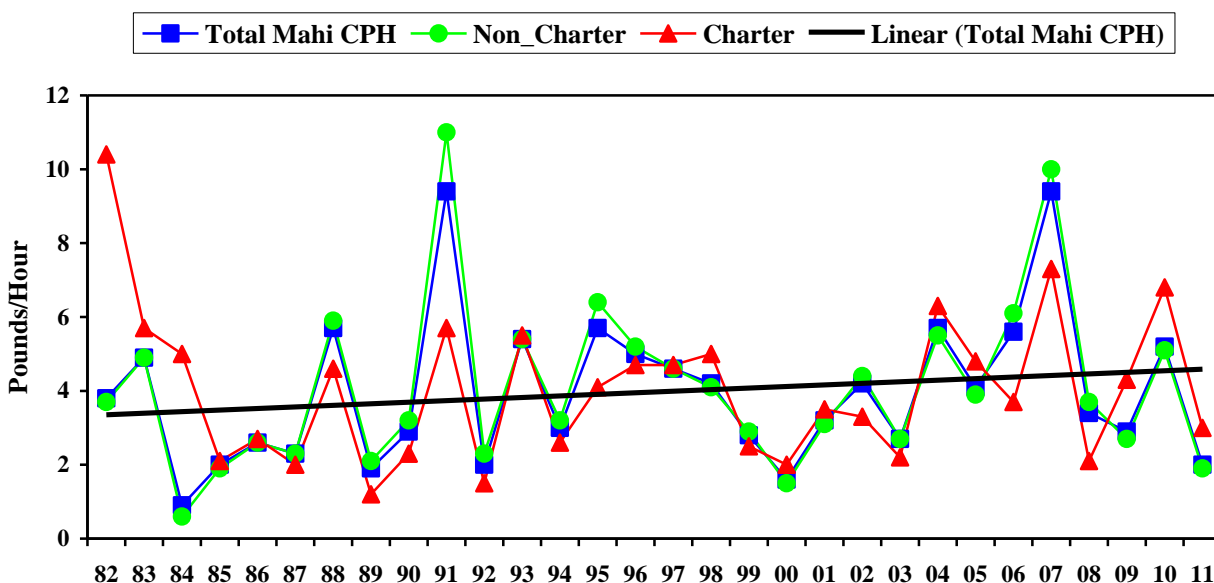
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files.

**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method. This plot and table of catch per unit of effort (CPUE) are based on the total annual landings of all troll catch, divided by the total number of hours spent fishing (gear in use).

**Boat-based Creel Trolling Catch Rates (Pounds/Hour)**  
**(data for Figure 10a)**

<b>Year</b>	<b>Catch Rate</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	15.1	15.0	20.2
1983	14.7	14.8	10.2
1984	14.6	14.7	12.7
1985	12.9	12.9	13.4
1986	9.9	10.1	7.5
1987	9.7	9.8	8.4
1988	14.0	14.6	10.4
1989	9.9	10.5	7.4
1990	11.7	12.9	8.8
1991	16.9	19.2	11.5
1992	12.0	15.0	7.1
1993	12.3	12.8	11.1
1994	11.8	13.2	8.2
1995	13.4	15.5	8.9
1996	14.3	15.3	12.0
1997	13.4	13.8	12.0
1998	13.5	14.2	10.4
1999	10.9	11.5	8.1
2000	11.5	11.8	10.1
2001	13.0	13.4	10.0
2002	13.0	13.6	9.2
2003	16.0	16.6	12.6
2004	20.1	20.3	18.9
2005	11.5	11.8	10.2
2006	16.8	18.5	10.6
2007	19.8	21.3	13.7
2008	16.7	18.7	8.3
2009	14.1	14.5	10.4
2010	13.7	14.0	11.4
2011	13.0	13.4	8.1
<b>Average</b>	<b>13.7</b>	<b>14.5</b>	<b>10.7</b>
<b>Standard Deviation</b>	<b>2.5</b>	<b>2.8</b>	<b>3.0</b>

Figure 10b. Guam Trolling Catch Rates (Lbs/Hr): Mahimahi



**Interpretations:** The wide fluctuations in mahimahi CPUE values are probably due to the high variability in the year-to-year abundance and availability of the stocks. It is not possible to allocate species-specific effort one particular species; effort used to target other species can result in artificially high or low catch rates for a given species. In 2011, the catch rate for total and non-charter mahimahi decreased 62%, and 63%, respectively, while charter CPUE decreased by 56%. Total mahimahi CPUE is 50% below the 30 year average.

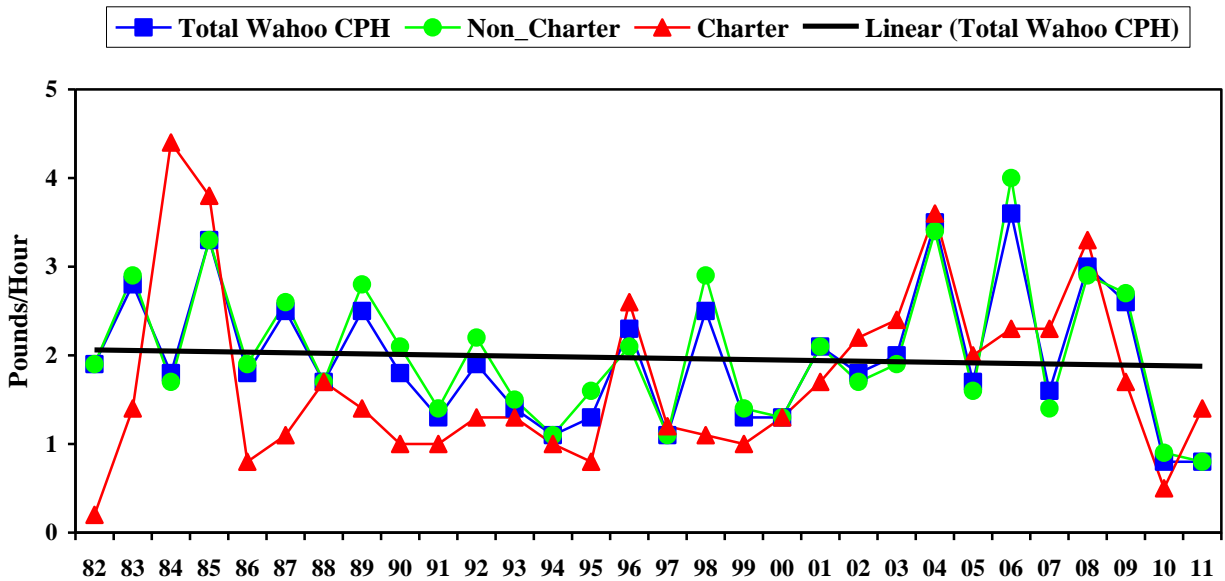
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files.

**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method. This plot and table of catch per unit of effort (CPUE) are based on the total annual landings of mahimahi divided by the total number of hours spent fishing (gear in use).

**Boat-based Creel Trolling Catch Rates (Pounds/Hour)**  
**(data for Figure 10b)**

<b>Year</b>	<b>Total Mahimahi</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	3.8	3.7	10.4
1983	4.9	4.9	5.7
1984	0.9	0.6	5.0
1985	2.0	1.9	2.1
1986	2.6	2.6	2.7
1987	2.3	2.3	2.0
1988	5.7	5.9	4.6
1989	1.9	2.1	1.2
1990	2.9	3.2	2.3
1991	9.4	11.0	5.7
1992	2.0	2.3	1.5
1993	5.4	5.4	5.5
1994	3.0	3.2	2.6
1995	5.7	6.4	4.1
1996	5.0	5.2	4.7
1997	4.6	4.6	4.7
1998	4.2	4.1	5.0
1999	2.8	2.9	2.5
2000	1.6	1.5	2.0
2001	3.2	3.1	3.5
2002	4.2	4.4	3.3
2003	2.7	2.7	2.2
2004	5.7	5.5	6.3
2005	4.1	3.9	4.8
2006	5.6	6.1	3.7
2007	9.4	10.0	7.3
2008	3.4	3.7	2.1
2009	2.9	2.7	4.3
2010	5.2	5.1	6.8
2011	2.0	1.9	3.0
<b>Average</b>	<b>4.0</b>	<b>4.1</b>	<b>4.1</b>
<b>Standard Deviation</b>	<b>2.0</b>	<b>2.2</b>	<b>2.0</b>

Figure 10c. Guam Trolling Catch Rates (Lbs/Hr): Wahoo



**Interpretations:** The wide fluctuations in CPUE are probably due to the high variability in the year-to-year abundance and availability of the stocks. The trend for the 30 year series has remained virtually unchanged. In 2011, all three categories declined. Total wahoo CPUE remained unchanged, while non-charter CPUE decreasing by 11%. Charter CPUE increased by 180%. Total CPUE is 60% below the 30 year average.

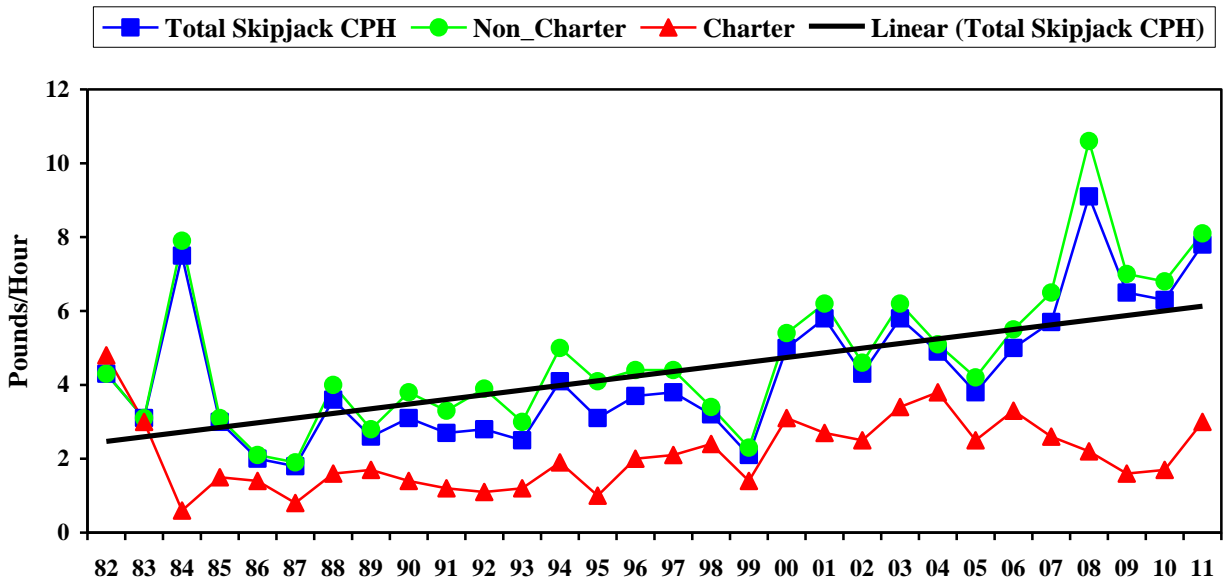
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files.

**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method. This plot and table of catch per unit of effort (CPUE) are based on the total annual landings of wahoo divided by the total number of hours spent fishing (gear in use).

**Boat-based Creel Trolling Catch Rates (Pounds/Hour)**  
**(data for Figure 10c)**

<b>Year</b>	<b>Wahoo</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	1.9	1.9	0.2
1983	2.8	2.9	1.4
1984	1.8	1.7	4.4
1985	3.3	3.3	3.8
1986	1.8	1.9	0.8
1987	2.5	2.6	1.1
1988	1.7	1.7	1.7
1989	2.5	2.8	1.4
1990	1.8	2.1	1.0
1991	1.3	1.4	1.0
1992	1.9	2.2	1.3
1993	1.4	1.5	1.3
1994	1.1	1.1	1.0
1995	1.3	1.6	0.8
1996	2.3	2.1	2.6
1997	1.1	1.1	1.2
1998	2.5	2.9	1.1
1999	1.3	1.4	1.0
2000	1.3	1.3	1.3
2001	2.1	2.1	1.7
2002	1.8	1.7	2.2
2003	2.0	1.9	2.4
2004	3.5	3.4	3.6
2005	1.7	1.6	2.0
2006	3.6	4.0	2.3
2007	1.6	1.4	2.3
2008	3.0	2.9	3.3
2009	2.6	2.7	1.7
2010	0.8	0.9	0.5
2011	0.8	0.8	1.4
<b>Average</b>	<b>2.0</b>	<b>2.0</b>	<b>1.7</b>
<b>Standard Deviation</b>	<b>0.7</b>	<b>0.8</b>	<b>1.0</b>

Figure 11a. Guam Trolling Catch Rates (Lbs/Hr): Skipjack



**Interpretations:** The wide fluctuations in CPUE for skipjack tuna are probably due to the high variability in the year-to-year abundance and availability of the stocks, although skipjack tuna is caught year round. However, it is not possible to allocate species-specific effort, since effort used to target other species can result in an artificially high or low catch rate for a given species. In 2011, the catch rates for total and non-charter increased by 23.8% and 19.1%, respectively. Charter rates increased 76.5% in 2011. Total CPUE was 81% above the 30-year average.

**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

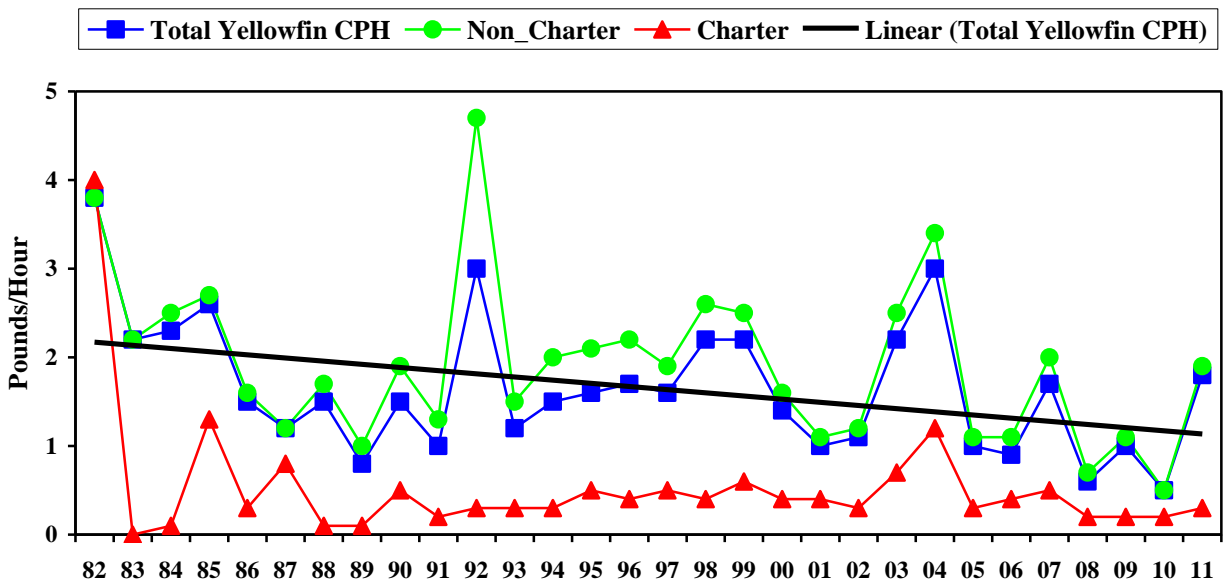
**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method surveyed. This plot and table of catch per unit of effort (CPUE) are based on the total annual landings of skipjack divided by the total number of hours spent fishing (gear in use).

**Boat-based Creel Trolling Catch Rates (Pounds/Hour)**  
**(data for Figure 11a)**

<b>Year</b>	<b>Total Skipjack</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	4.3	4.3	4.8
1983	3.1	3.1	3.0
1984	7.5	7.9	0.6
1985	3.0	3.1	1.5
1986	2.0	2.1	1.4
1987	1.8	1.9	0.8
1988	3.6	4.0	1.6
1989	2.6	2.8	1.7
1990	3.1	3.8	1.4
1991	2.7	3.3	1.2
1992	2.8	3.9	1.1
1993	2.5	3.0	1.2
1994	4.1	5.0	1.9
1995	3.1	4.1	1.0
1996	3.7	4.4	2.0
1997	3.8	4.4	2.1
1998	3.2	3.4	2.4
1999	2.1	2.3	1.4
2000	5.0	5.4	3.1
2001	5.8	6.2	2.7
2002	4.3	4.6	2.5
2003	5.8	6.2	3.4
2004	4.9	5.1	3.8
2005	3.8	4.2	2.5
2006	5.0	5.5	3.3
2007	5.7	6.5	2.6
2008	9.1	10.6	2.2
2009	6.5	7.0	1.6
2010	6.3	6.8	1.7
2011	7.8	8.1	3.0
<b>Average</b>	<b>4.3</b>	<b>4.8</b>	<b>2.1</b>
<b>Standard Deviation</b>	<b>1.8</b>	<b>1.9</b>	<b>1.0</b>



Figure 11b. Guam Trolling Catch Rates (Lbs/Hr): Yellowfin



**Interpretations:** The wide fluctuations in CPUE for yellowfin tunas are probably due to the high variability in the year-to-year abundance and availability of the stocks. It is not possible to allocate species-specific effort, since effort used to target other species can also result in an artificially high or low catch rate for a given species. In 2011, the yellowfin catch rates for total and non-charter catch increased by 260% and 280% respectively. Charter CPUE increased 50%. All three categories are near their 30-year averages.

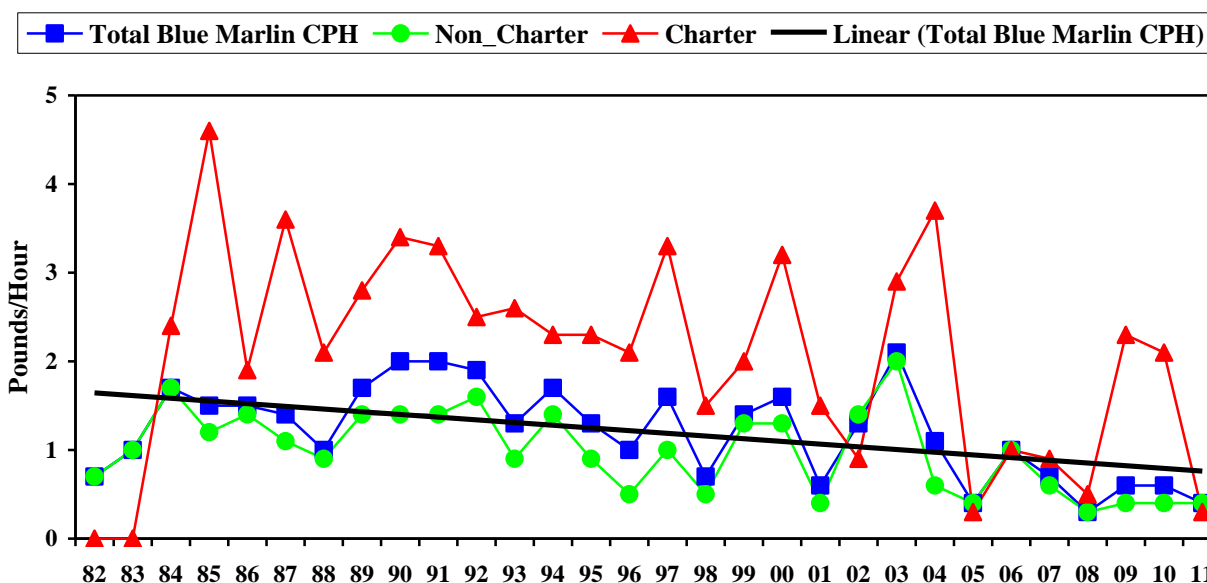
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method surveyed. This plot and table of catch per unit of effort (CPUE) are based on the total annual landings of Yellowfin divided by the total number of hours spent fishing (gear in use).

**Boat-based Creel Trolling Catch Rates (Pounds/Hour)**  
**(data for Figure 11b)**

<b>Year</b>	<b>Total Yellowfin</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	3.8	3.8	4.0
1983	2.2	2.2	0.0
1984	2.3	2.5	0.1
1985	2.6	2.7	1.3
1986	1.5	1.6	0.3
1987	1.2	1.2	0.8
1988	1.5	1.7	0.1
1989	0.8	1.0	0.1
1990	1.5	1.9	0.5
1991	1.0	1.3	0.2
1992	3.0	4.7	0.3
1993	1.2	1.5	0.3
1994	1.5	2.0	0.3
1995	1.6	2.1	0.5
1996	1.7	2.2	0.4
1997	1.6	1.9	0.5
1998	2.2	2.6	0.4
1999	2.2	2.5	0.6
2000	1.4	1.6	0.4
2001	1.0	1.1	0.4
2002	1.1	1.2	0.3
2003	2.2	2.5	0.7
2004	3.0	3.4	1.2
2005	1.0	1.1	0.3
2006	0.9	1.1	0.4
2007	1.7	2.0	0.5
2008	0.6	0.7	0.2
2009	1.0	1.1	0.2
2010	0.5	0.5	0.2
2011	1.8	1.9	0.3
<b>Average</b>	<b>1.7</b>	<b>1.9</b>	<b>0.5</b>
<b>Standard Deviation</b>	<b>0.8</b>	<b>0.9</b>	<b>0.7</b>

Figure 11c. Guam Trolling Catch Rates (Lbs/Hr): Blue Marlin



**Interpretations:** The wide fluctuations in CPUE are probably due to the high variability in the year-to-year abundance and availability of the stocks. Since it is not possible to allocate species-specific effort, effort used to target other species can also result in an artificially high or low catch rate for a given species. The 2011 blue marlin non charter catch rates were virtually unchanged from 2010. Total CPUE was down 33%, while charter CPUE was down 86% Total catch CPUE is 67% below the 30 year average

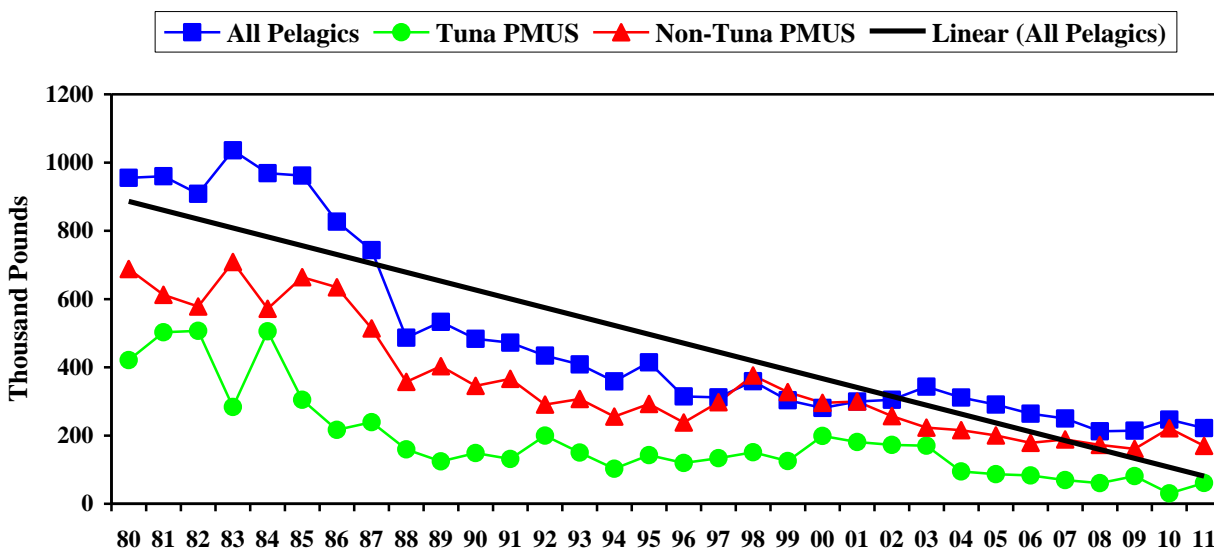
**Source:** The Division of Aquatic and Wildlife Resources (DAWR) offshore creel sampling program and its associated computerized data expansion system files, expanded with the assistance of NMFS.

**Calculation:** The data expansion system is run on a calendar year's worth of survey data to produce catch and effort estimates for each fishing method surveyed. This plot and table of catch per unit of effort (CPUE) are based on the total annual landings of marlin divided by the total number of hours spent fishing (gear in use).

**Boat-based Creel Trolling Catch Rates (Pounds/Hour)**  
**(data for Figure 11c)**

<b>Year</b>	<b>Total Blue Marlin</b>	<b>Non-Charter</b>	<b>Charter</b>
1982	0.7	0.7	0.0
1983	1.0	1.0	0.0
1984	1.7	1.7	2.4
1985	1.5	1.2	4.6
1986	1.5	1.4	1.9
1987	1.4	1.1	3.6
1988	1.0	0.9	2.1
1989	1.7	1.4	2.8
1990	2.0	1.4	3.4
1991	2.0	1.4	3.3
1992	1.9	1.6	2.5
1993	1.3	0.9	2.6
1994	1.7	1.4	2.3
1995	1.3	0.9	2.3
1996	1.0	0.5	2.1
1997	1.6	1.0	3.3
1998	0.7	0.5	1.5
1999	1.4	1.3	2.0
2000	1.6	1.3	3.2
2001	0.6	0.4	1.5
2002	1.3	1.4	0.9
2003	2.1	2.0	2.9
2004	1.1	0.6	3.7
2005	0.4	0.4	0.3
2006	1.0	1.0	1.0
2007	0.7	0.6	0.9
2008	0.3	0.3	0.5
2009	0.6	0.4	2.3
2010	0.6	0.4	2.1
2011	0.4	0.4	0.3
<b>Average</b>	<b>1.2</b>	<b>1.0</b>	<b>2.2</b>
<b>Standard Deviation</b>	<b>0.5</b>	<b>0.5</b>	<b>1.1</b>

**Figure 12. Guam Annual Estimated Inflation-Adjusted Revenue per Trolling Trip:  
All Pelagics, Tuna PMUS, and Non-tuna PMUS**



**Interpretation:** There has been a general decrease from 1980 in the adjusted revenues per trolling trip for all pelagics, tunas and other PMUS, although the revenue values have remained fairly constant for past 9 years. In 2011, the adjusted revenue per trip increased for all pelagics by 10%. Tuna PMUS revenues increased by 98%, and non-tuna PMUS increased by 23%. Despite continual declines in revenues, trolling effort still occurs since most charter and non-charter trolling boats do not rely on selling fish caught as their primary source of income and a reliable market exists for members of the local fishermen's cooperative which provides additional income.

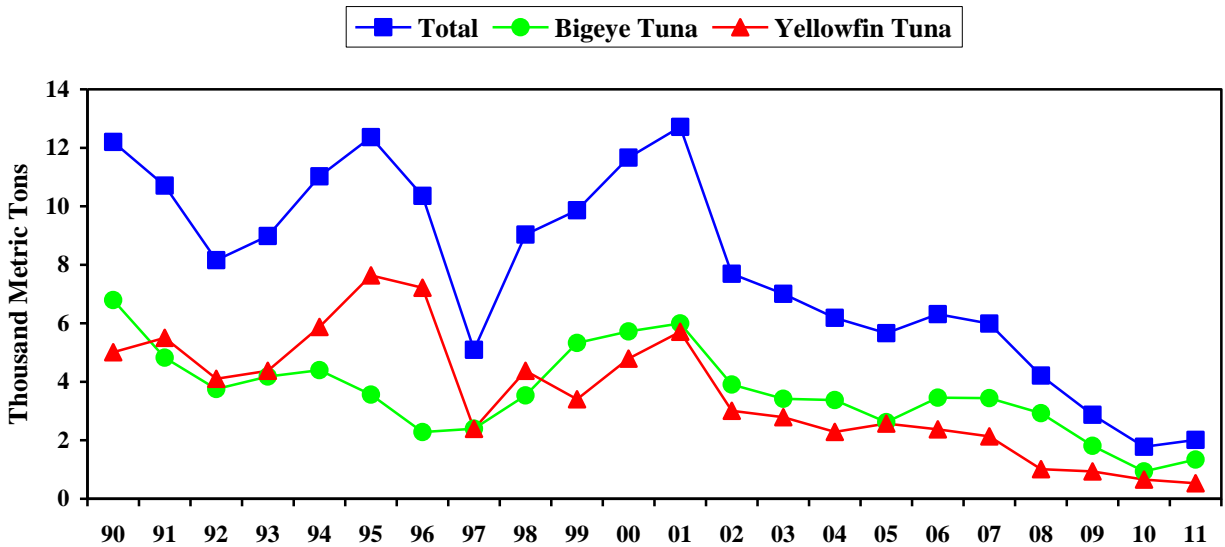
**Source:** The WPacFIN-sponsored commercial landings system.

**Calculation:** The average revenue per trip was calculated by summing the revenue of all species sold then dividing by the number of trips, and summing the revenue of tunas and other PMUS sold, and then dividing each by the number of trips, respectively, for any trip, which landed PMUS. Adjusted revenue per trip was derived from the Guam Annual Consumer Price Index (CPI).

**Inflation-Adjusted Revenues per Trolling Trip (\$/Trip)  
from Commercial Receipt Books (data for Figure 12)**

	All Pelagics		Tuna PMUS		Non-Tuna PMUS	
Year	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
1980	161.31	955.28	71.14	421.29	116.20	688.14
1981	195.29	960.05	102.24	502.61	124.58	612.44
1982	194.29	908.50	108.45	507.11	123.68	578.33
1983	229.26	1036.03	62.81	283.84	156.75	708.35
1984	233.01	968.62	121.56	505.32	137.48	571.50
1985	240.34	961.84	76.21	304.99	165.90	663.93
1986	212.25	826.71	55.68	216.87	162.89	634.46
1987	199.18	743.14	64.07	239.05	137.77	514.02
1988	137.30	486.87	44.98	159.50	100.78	357.37
1989	166.79	533.23	38.89	124.33	126.20	403.46
1990	172.68	483.33	53.19	148.88	123.50	345.68
1991	185.96	472.15	51.79	131.49	144.20	366.12
1992	188.33	434.10	86.72	199.89	126.18	290.84
1993	191.92	408.41	70.60	150.24	144.36	307.20
1994	197.09	358.70	56.32	102.50	140.32	255.38
1995	239.79	414.36	82.55	142.65	169.38	292.69
1996	191.10	314.55	72.55	119.42	144.71	238.19
1997	192.95	311.61	82.74	133.63	184.35	297.73
1998	221.01	359.14	92.81	150.82	231.44	376.09
1999	190.05	303.32	78.35	125.05	205.04	327.24
2000	179.42	280.79	127.01	198.77	189.00	295.79
2001	188.68	299.44	113.92	180.79	188.92	299.82
2002	193.42	305.02	109.41	172.54	162.85	256.81
2003	223.73	343.43	110.95	170.31	145.38	223.16
2004	215.10	311.25	65.56	94.87	149.03	215.65
2005	216.34	290.76	64.62	86.85	149.05	200.32
2006	219.47	264.24	68.83	82.87	148.26	178.51
2007	221.40	249.74	61.56	69.44	167.09	188.48
2008	196.13	212.21	55.86	60.44	159.29	172.35
2009	202.16	214.09	76.76	81.29	152.00	160.97
2010	238.87	246.51	29.75	30.70	214.40	221.26
2011	221.90	221.90	60.86	60.86	169.71	169.71
<b>Average</b>	<b>201.77</b>	<b>483.73</b>	<b>75.59</b>	<b>186.23</b>	<b>155.02</b>	<b>356.62</b>
<b>Standard Deviation</b>	<b>23.79</b>	<b>267.44</b>	<b>24.10</b>	<b>128.57</b>	<b>28.64</b>	<b>167.48</b>

**Figure 13. Guam Foreign Longline Transshipment Landings  
Longliners Fishing Outside the Guam EEZ**



**Interpretation:** Annual landings from a primarily foreign longline fishing fleet have ranged from a low of 2,874 metric tons in 2009 to a high of 12,627 metric tons in 2001. These vessels fish primarily outside Guam’s EEZ, but transship their catch through Guam. The dramatic drop observed in 1997 was due to a large number of foreign fishing boats leaving the western Pacific that year for several reasons, including availability of fish stocks. In 2011 total longline landings increased 13%, with bigeye landings increasing 43%, and yellowfin landings decreasing 19%. 2011 yellowfin totals were the lowest in the 22 year data set, and total catch was 74% below the 22 year average. The lower numbers may be due to a reduction in the number of agents reporting sales, and vessels relocating to other regions of the Pacific.

**Source:** The Bureau of Statistics and Plans.

**Calculation:** Pre-1990 data was extracted directly from transshipment agents' files. Beginning in 1990, a mandatory data submission program was implemented.

**Guam Foreign Longline Transshipment Landings**  
(data for Figure 13)

<b>Year</b>	<b>Total</b>	<b>Bigeye</b>	<b>Yellowfin</b>
1990	12198	6793	5011
1991	10707	4824	5505
1992	8157	3754	4104
1993	8981	4178	4379
1994	11023	4400	5878
1995	12366	3560	7635
1996	10356	2280	7214
1997	5093	2395	2392
1998	9032	3533	4379
1999	9865	5328	3404
2000	11664	5725	4795
2001	12716	5996	5711
2002	7691	3904	3011
2003	7010	3418	2788
2004	6190	3375	2287
2005	5660	2618	2574
2006	6315	3455	2377
2007	5991	3439	2134
2008	4215	2926	1014
2009	2874	1813	934
2010	1779	935	656
2011	2016	1343	532
<b>Average</b>	<b>7814</b>	<b>3636</b>	<b>3578</b>
<b>Standard Deviation</b>	<b>3299</b>	<b>1448</b>	<b>2003</b>



**Table 4. Numbers of Trips and Interviews for Creel Trolling Method**

<b>Year</b>	<b>Survey Days</b>	<b>Trips in Boat Log</b>	<b>Interviews</b>
1982	46	393	363
1983	47	363	351
1984	54	486	365
1985	66	737	503
1986	49	629	382
1987	48	614	431
1988	51	1032	698
1989	60	1053	642
1990	60	1098	804
1991	60	1097	773
1992	60	1170	843
1993	61	1149	844
1994	69	1224	878
1995	96	1540	1110
1996	96	1543	1146
1997	96	1378	949
1998	96	1477	1052
1999	96	1436	917
2000	96	1338	854
2001	96	1076	620
2002	84	730	396
2003	79	531	289
2004	96	716	366
2005	97	698	377
2006	96	763	413
2007	96	755	391
2008	96	788	405
2009	96	1018	604
2010	96	1135	683
2011	96	878	496

#### 4b. Trolling Bycatch: Summary

Year	Released alive	Released dead/injured	Total Number Released	Total Number Landed	Percent Bycatch*	Interviews with Bycatch	Total Number of Interviews	Percent of Interviews with Bycatch
2001	7	3	10	5,289	0.2	10	461	2.2
2002	1	2	3	3,443	0.1	3	258	1.2
2003	5	0	5	3,026	0.2	2	178	1.1
2004	0	0	0	4,292		0	91	0
2005	3	0	3	2,631	.11	3		
2006	2	1	3	3,478	.09	3	413	.7
2007								
2008	1	0	1	3,495	.02	1	98	1.02
2009	2	1	3	3,478	.08	3	604	.05
2010	0	0	0	6,085	0	0	670	0
2011	0	1	1	7100	.00014	1	496	.002

\*"percent bycatch" represents the number of pieces that were discarded compared to the total number of fish caught trolling. The bycatch information is from unexpanded data, taken only from actual interviews that reported bycatch.

**Interpretation:** Bycatch information was recorded beginning in 2000 as a requirement of the pelagic FMP. Historically, most fish that is landed by fishermen is kept regardless of size and species. Bycatch for this fishery are sharks, shark-bitten pelagics, small pelagics, or other pelagic species. In 2010, bycatch was not encountered by Fisheries staff when interviewing trollers.

**Source:** The DAWR creel survey data for boat based methods.

**Calculations:** Bycatch is obtained directly from trolling interviews where bycatch was voluntarily reported. The number of bycatch reported is from unexpanded data.

#### Bycatch Summary

Species Name	Number Released			Number Caught	Bycatch(%)
	Number Alive	Released Dead/Injured	Both		
Non-Charter					
Katsuwonus pelamis	0	1	1	7100	0
Non Charter Bycatch Total	0	1.00	1.00		
Charter					
Charter Bycatch Total	0	0.00	0.00		
All Bycatch Total	0	1	1		